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# GRANGER FOUNDRY & MACHINE CO.,

**PROVIDENCE, R. I.**

TS1300
.T36

Bleaching, Dyeing, Drying and Finishing Machinery.

Cotton, Paper and Husk Rolls.

## TENTERING MACHINES

**With Patent Self-Feeding Clips.**

## Patent Combination Rolls

—OF—

**HUSK AND COTTON.**

Calenders, Mangles, Drying Machines, Tentering Machines, Hydraulic Presses, Etc.

## —BEETLES—

Short and Long Chain Dyeing, Sizing and Drying Machines.

**PATENT**

**OIL, COMBINED "PLATE and FLAME"**

**SINCEINC MACHINES.**

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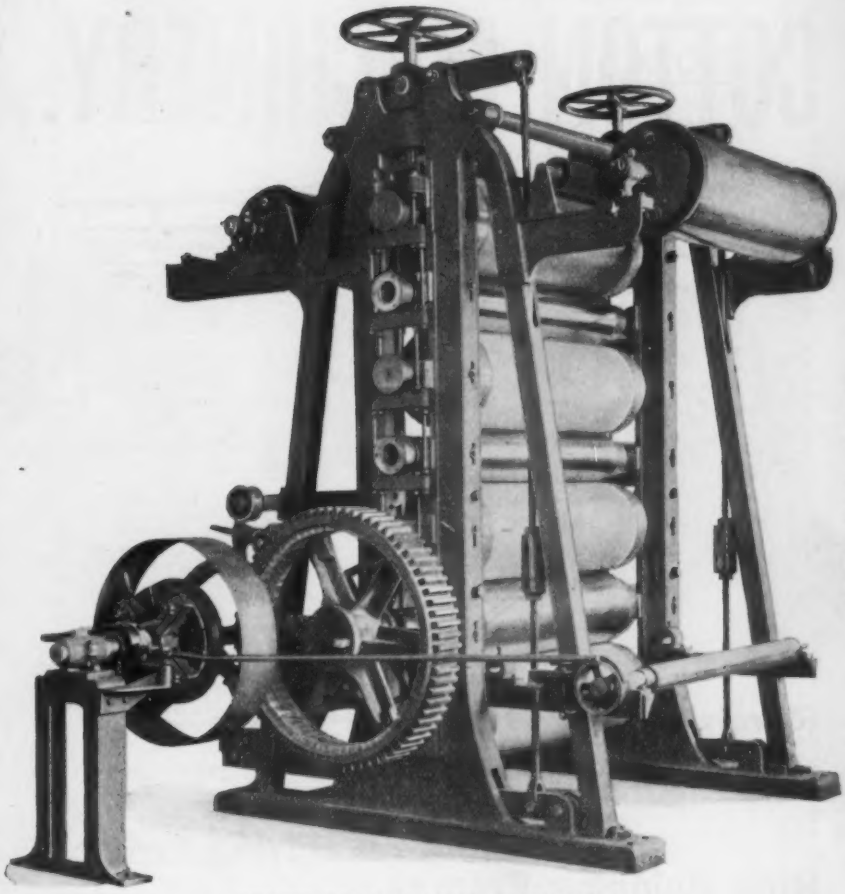
**SINCEINC MACHINES.**

K.I.T. S. Bot. 31-8

# BLEACHING, PRINTING, DYEING AND FINISHING MACHINERY,

## .... For Textile Fabrics ....



SEVEN-ROLL WATER MANGLE.

Paper, Cotton, Husk, Patent Combination Rolls, Etc.

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**Lowell, Mass.,**

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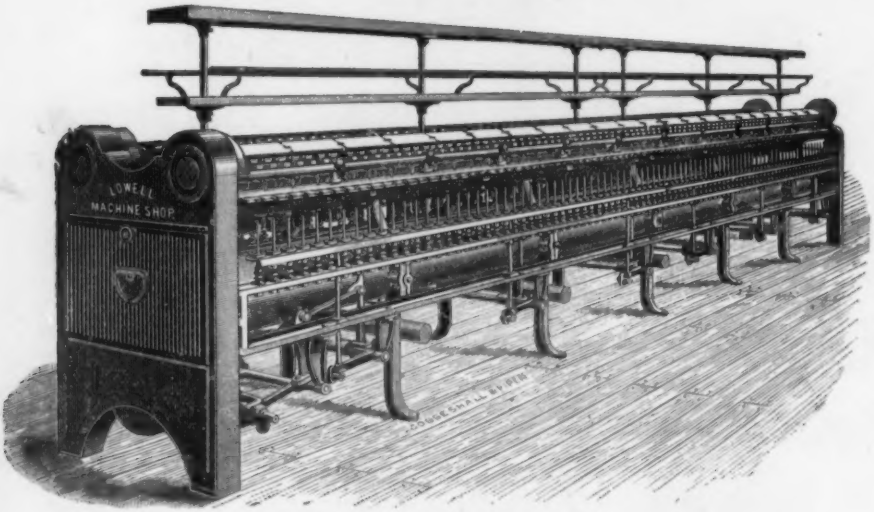


**Revolving Flat Cards,**
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**Roving Frames,**
**Ring Spinning Frames,**
**Twisters, Spoolers,**
**Warpers, Slashers,**
**Looms.**

# WORSTED MACHINERY.

EIGHTY COTTON MILLS

HAVE NOW ORDERED

# Northrop . . Looms

**With a Record of 25,000 sold the Skeptics should be thoroughly silenced . . . . .**

We are not only selling a machine requiring but one half or less of the usual attention, but one that produces a better, as well as a cheaper, product.

We believe we have called this fact to the attention of the manufacturing public before, but constant reiteration is sometimes necessary with that class of human nature which persistently overlooks its own self-interest.

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Revolving Flat Carding Engines,
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Wet and Dry Twisters,
Looms,

Railway Heads,
Drawing Frames,
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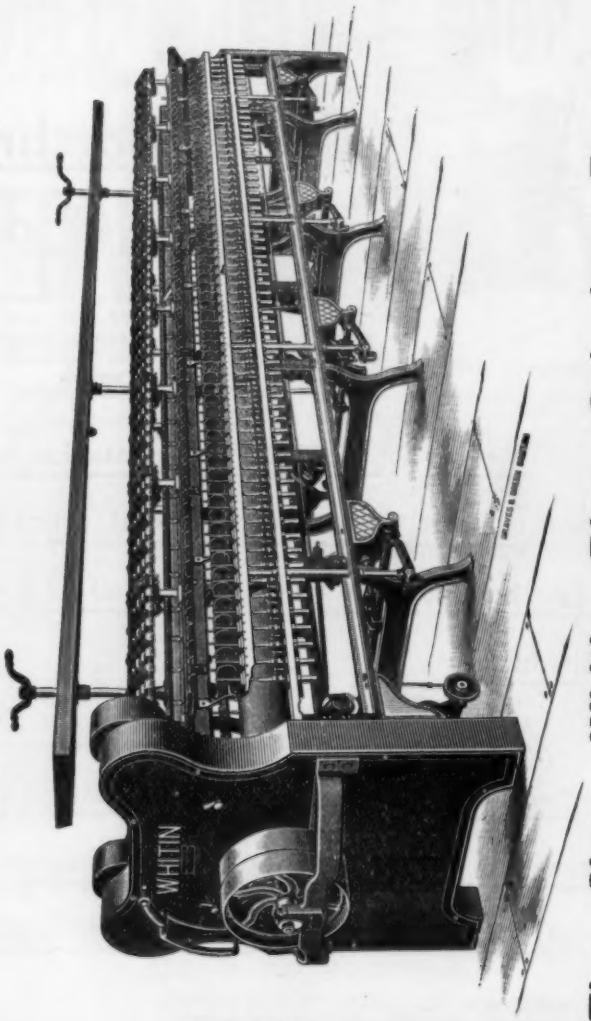


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**S. W. CRAMER, Southern Agent.**

# MASON MACHINE WORKS,

**TAUNTON, MASS.**

# COTTON MACHINERY

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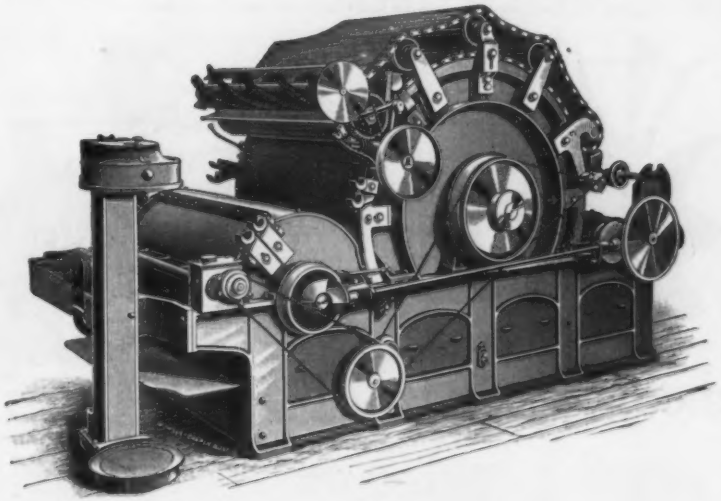

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INCLUDING THE

## Mason-Northrop Loom.

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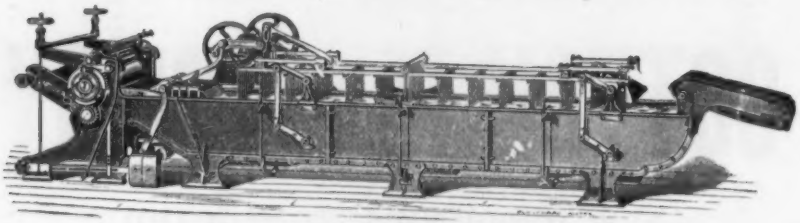
# Preparing and Drying Machinery.



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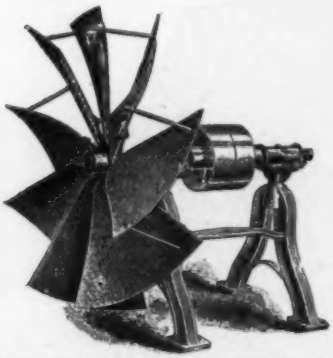
In addition to the above, we are the only builders of **Four Rake and Hydraulic Washers.** We guarantee our machines to be the **Lightest Running** and to require the **Least Repair** of any on the market. **Production and results are second to none.**



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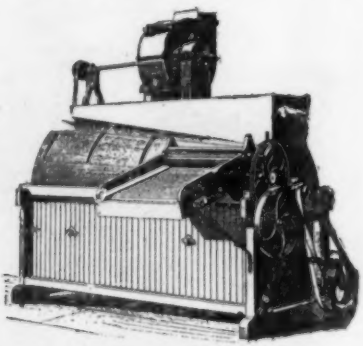
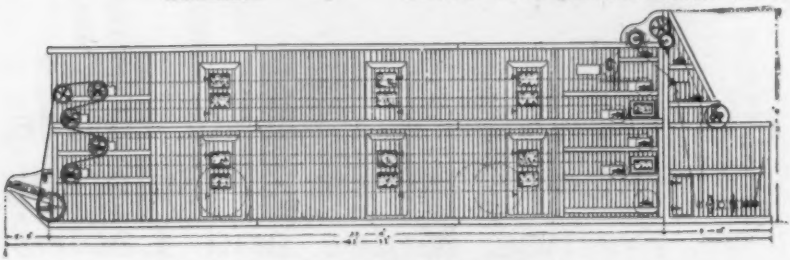


IMPROVED CONE DUSTER.
Exterior View Right-Hand Machine with Fan.



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*DRAWING FRAMES* With Mechanical or Electric Stop-Motion.
*SLUBBING FRAMES*
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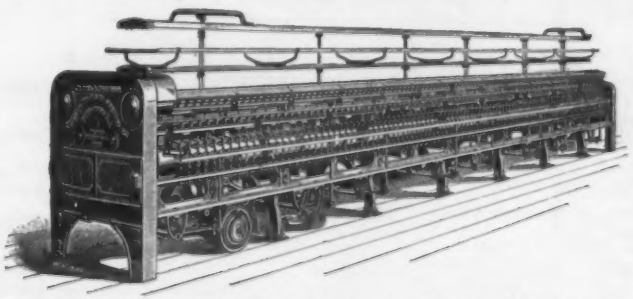
*ROVING FRAMES*

## Improved New Pattern Spinning Frames.



This New Pattern Spinning Frame contains many valuable improvements which will certainly interest you and pay you to investigate. All parts are specially designed and so constructed as to obtain the highest speed and greatest production.

*We Invite Investigation and Comparison.*

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for WOOL, SHODDY, and COTTON, is

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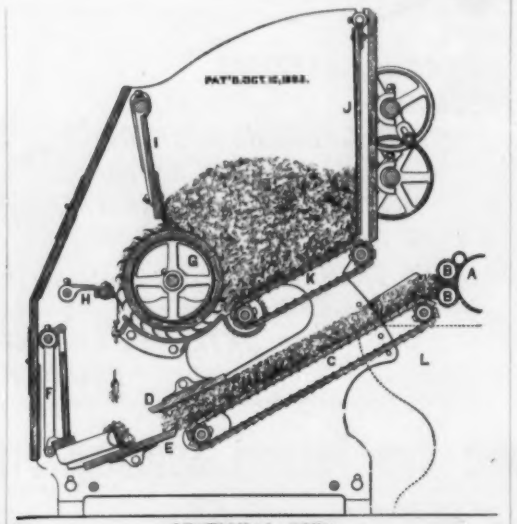
GENTLEMEN—In answer to your inquiry of to day as to how we like the FISHER FEEDS would say that, after running one for three months and having put in four more since, is sufficient evidence that we consider the Fisher Feeds the best in the market to-day, and you are at liberty to bring any interested person into our mill to see them running and judge for themselves. Yours truly, WOONSOCKET WORSTED MILLS,
EDWIN FARNELL, Agent.

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**THE FISHER CARD FEED** is simple in construction, is strongly built, turns out even work, requires little changing, and feeds the same whether full or nearly empty.
It is built in all sizes and guaranteed as represented.

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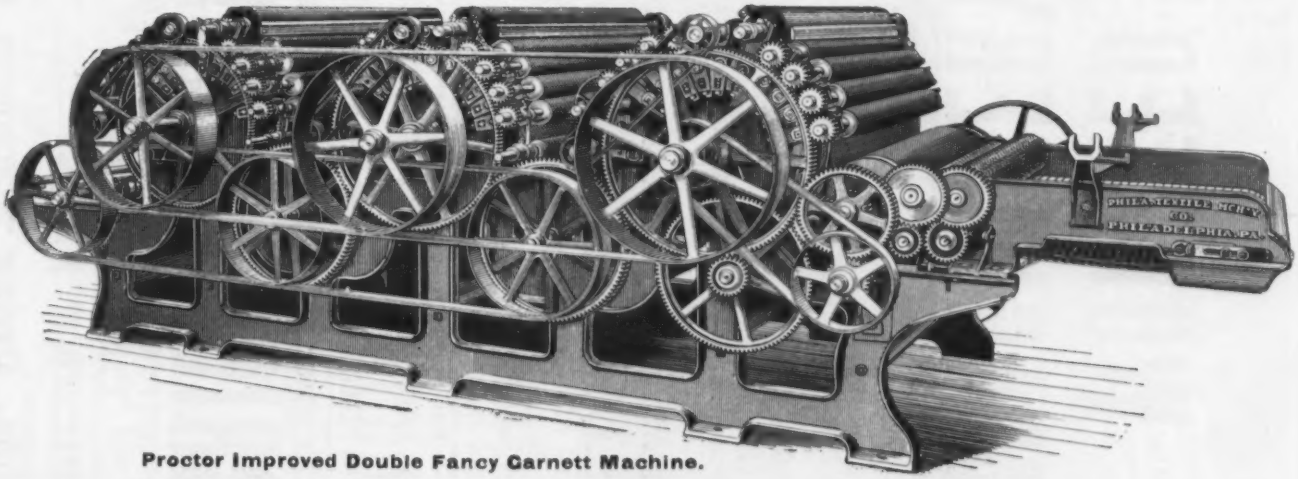


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We Build Looms for Weaving all Grades of Goods.

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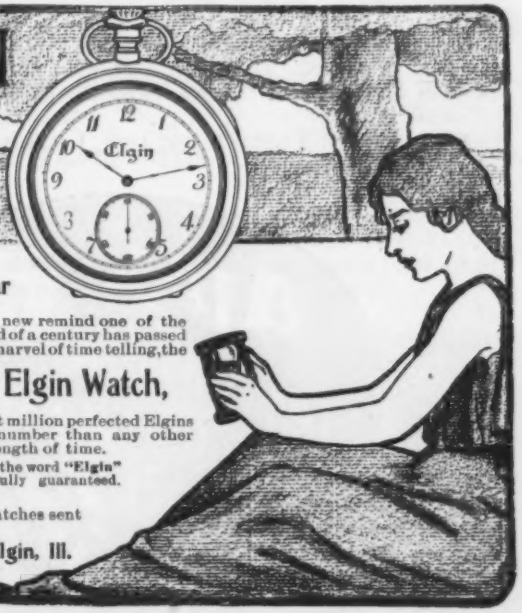


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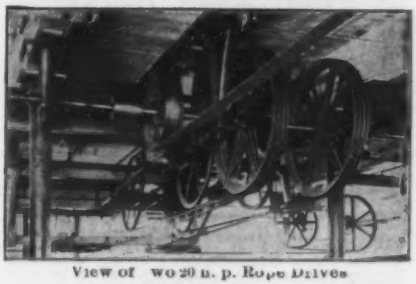

View of two 20 h. p. Rope Drives in yarn mill of W. H. GRUNDY & Co., Bristol, Pa.

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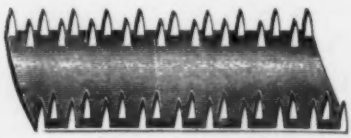

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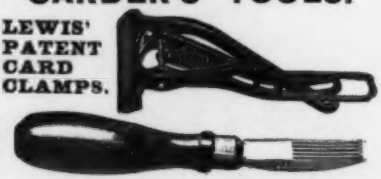

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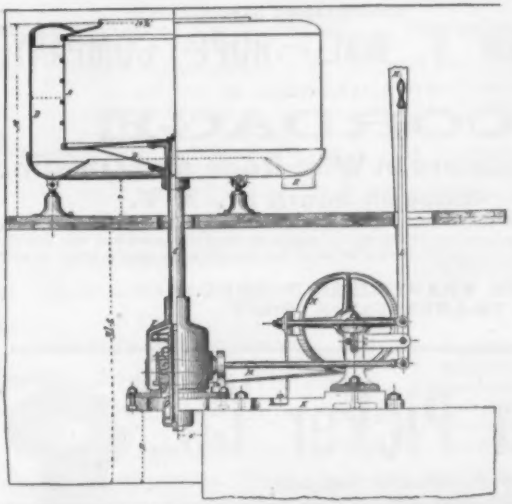

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# Patents

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**PHILLIPS & ANDERSON,**

Attorneys-at-Law and Solicitors in Patent Causes,

**Exchange Bldg., 53 State St., Boston, Mass.**

Mr. Van Everen, of our office, was for a number of years an Examiner in the U. S. Patent Office, in the Division of Textiles.


## List of Textile Patents.

**Issued November 22 and 29, and December 6, 13 and 20, 1898.**

**Bobbin Holder.** 614,488. W. E. Morton, Clover, S. C., assignor of one-half to the Draper Company, Portland, Me. and Hopedale, Mass.

**Carding Machine, Flat Grinding Mechanism.** 615 016. J. Eatough, assignor to Howard & Bullough American Machine Company, Ltd., Pawtucket, R. I.

**Cloth Shearing Machine.** 615,190. M. LaFountain, Jr., assignor to Woonsocket Napping Machinery Co., Woonsocket, R. I.

**Cotton Chopper.** 615,175. A. Hillermann and C. Heinen, Henrietta, Texas.

**Cloth Cutting Machine.** 616,216. H. Warth, assignor to A. Warth, New York City.

**Cotton Chopper and Cultivator.** 616,388. A. Abramson, Baton Rough, La.

**Cotton Press.** 616,341. W. R. Mason, assignor of three-fourths to S. M. Carlton, S. Walker, D. E. Morris, A. M. Walker, E. S. Crumley and J. B. Loftin, Hillsboro, Texas.

**Cotton Gin Roller Covering.** 615,103. E. L. Peterson, Willacoochee, Ga.

**Dyeing Apparatus.** 614,868. R. M. Hunter, Philadelphia, Pa.

**Dye and Making It, Indigo-blue.** 614,538. R. Demuth, Elberfeld, Germany, assignor to Farbenfabriken of Elberfeld, Company, New York.

**Fabrics, Machine for Cutting Ribbed.** 616,280. C. F & H. F. Adams, Reading, Pa.

**Fabric Cleaning Machine.** 614,832. F. Burger, assignor of three-fourths to H. M. Williams, Fort Wayne, Ind.

**Fabric, Plaited.** 29,723. W. Lowe, Nottingham, England, assignor to the Kursheedt Manufacturing Company, New York.

**Hat, Fur or Wool.** 615,944. W. D. Zerfi and F. G. Riedel, assignors to Carlton & Company, Stockport, England.

**Knitting Machine, Straight.** 614,569. C. H Aldridge, Loughborough, England.

**Knitting Machine.** 615,384. G. E. Frink, assignor t E. Jenckes Manufacturing Company, Pawtucket, R. I.

**Knitting Machine Attachment.** 615,585. F. W. Sumner, Canton, Mass.

**Knitting Machine, Circular.** 616 344. D. McGenniss, assignor of one-half to O. C. Burt, Easthampton, Mass.

**Loom Shuttle.** 616,297. W. F. Draper, Hopedale, Mass., assignor to Draper Company, Hopedale, Mass. and Portland, Me.

**Loom Shuttle Changing Mechanism.** 616,234. E. Herzig, West Hoboken, N. J.

**Loom Stop Indicator.** 616,055 W. G. Eaton, Nashua, N. H., assignor to Draper Company, Portland, Me. and Hopedale, Mass.

(Continued on next page.)


# Holland and Colonies.

**Patents. Trade Marks.**

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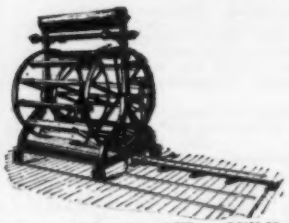

Universal Sectional Warp Mill No. 123.

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This machine will commend itself to every practical man. It overcomes so many of the usual difficulties which confront the dresser that it should appeal to him at once.

Here are a few points.

Does not require section pins. Made any width.

Can be adjusted in a few minutes, to make fine or coarse warp.

A worm on the end of the Swift shaft engages with a worm gear on top of a vertical shaft extending downward and having on the end a pinion, which meshes into a rack on the floor. As the Swift revolves, the Reel is propelled at a proper speed to cause the warp to mount the Coning Irons on the end of the Swift rails, building the section in the form of a cone. The angle of the Coning Irons and the traversing pinion are easily changed to adapt the Reel to the different kinds of warp. We also make all kinds of Dresser Spoolers, Warpers, etc., as well as a complete line of woolen

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**Loom.** 615,582. R. Crompton and H. Wyman, assignors to Crompton & Knowles Loom Works, Worcester, Mass.

**Loom Attachment.** 615,635. J. Peltier, assignor of one-half to F. X. Gravel, Lowell, Mass.

**Loom Shuttle.** 615,567. J. H. Morin, assignor to D. T. Dudley & Son Company, Wilkinsonville, Mass.

**Loom Temple.** 615,536. P. Duffy, assignor of one-half to J. F. Powers, New Bedford, Mass.

**Loom Take-up Mechanism.** 616,064. J. H. Northrop, Hopedale, Mass., assignor to Draper Company, Hopedale, Mass. and Portland, Me.

(Continued on page 127.)


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LOUIS SIMPSON.

# TEXTILE WORLD.

Vol. XVI. JANUARY, 1899. No. 1.

## LOUIS SIMPSON.

Louis Simpson was born near Manchester, England, Feb. 15th, 1853. His father was Thomas Simpson of the firm of J. A. & Thos. Simpson, wholesale dry goods merchants, Manchester. His mother was Maria Gillett, of Street, Somersetshire, whose father was a retired hosiery manufacturer. Both of his parents were members of the Society of Friends, though they eventually left that body and joined the Congregationalists.

He was educated at the Great Ealing School, near London, for three years, and then was for three years with a private tutor, the Rev. W. W. Willson, who was then Curate of St. Mary's Church, near Godalming, Surrey. He was then apprenticed for four years to his eldest brother, Albert Simpson, of Preston, cotton spinner and manufacturer, just after the close of the American war. During this period he went through every department of the mills from office to the gray room for woven cloth, the gray goods made being heavily sized goods for the Indian and Chinese markets.

After having to do with the management of certain family concerns in which mills gray goods for printing and bleaching were made, also fancy muslins and dress goods,—plain, satin and figured,—he was given the charge of the Gibraltar Mills at Hyde, Cheshire, which he reorganized. At these mills, for the first time in the history of the trade, he made 32/40 extra hard, or crape, yarn upon the ring frame and made it satisfactorily. Besides these yarns, 20's to 40's super Montreal Cotton Co.'s Institute; also of the Valleyfield Amateur Athletic yarns were made for the Bradford trade, and print cloths, plain and fancy, for the calico printers. At the end of three years he was offered the management of the Nova Scotia Cotton Co. at Halifax, N. S., which mill made gray sheetings, and gray and dyed single and double yarns.

When Mr. Simpson had been at the latter mill twelve months he was offered the management of the Montreal Cotton Co. at Valleyfield, which offer was accepted, leaving Halifax after fifteen months' service. He still retains this position with the Montreal Cotton Co. at Valleyfield, Quebec, which offer was accepted, leaving Halifax after fifteen months' service. He still retains this position with the Monshares are worth over $150.00. The mills then contained 50,000 spindles and 1,300 looms; but with the present extensions just being completed they will hold 150,000 spindles and 3,500 looms.

Mr. Simpson was married to Ellen Ashton, daughter of the late Thomas Ashton, of the cotton manufacturing concern of Eccles, Shorrock Bros. & Co., of Darwen England.

Mr. Simpson is a justice of the peace of the District of Beauharnois, which includes the counties of Beauharnois, Huntingdon and Chateauguay; is a Protestant school trustee, and also the trustee for the buildings and endowment of the schools for which Valleyfield is indebted to the generosity of A. F. Gault, President of the Montreal Cotton Co.; and is president of the

Association. He is also vice-president of the Northrop Loom Co. of Canada, which concern was incorporated last June, and whose works were ready to start up the middle of December, making looms.

Mr. Simpson takes a great interest in farming so far as improved methods are concerned, and is a life member of the Province of Quebec Dairy Association. He has taken in the past considerable interest in Canadian politics, having taken an active part in most of the elections which have occurred in the county during the last ten years, but the continued extension of the works of the Montreal Cotton Co. has necessitated his withdrawing from all work of this kind.

The works of the Montreal Cotton Co. consist of a group of mills all connected by gangways, etc., containing the 150,000 spindles and 3500 looms, aforesaid, a bleachery, dyeing and finishing works, capable of handling 120 tons of cloth per week, warehousing sufficiently large to store 15,000 bales of cotton, necessary finished-goods warehouses, a saw mill, box, window and sash factory. The company does all its own construction work. The mills are driven by water power, the water being obtained from the River St. Lawrence, with a fall of 13 feet, through 21 vertical turbines. Part of this power, 2,200 H. P., is converted into electricity for electrical driving. This power house was erected under Mr. Simpson's personal supervision.

The goods which are now being made in the works of the Montreal Cotton Co. comprise all the different kinds of linings used by men, women and children, also dress goods, imitation worsted goods, fancy muslins, lawns, bookbinders' cloth, window shades, etc.

---

—Mordants of a corrosive nature must be used with great caution where colors are fixed by steaming, as the wool fibre, under the influence of heat and pressure, is more readily corroded and tendered.

## *DEVELOPMENT OF OUR EXPORT TRADE.*

There has been published a number of interesting consular reports, relating to foreign trade, from which we are enabled to gather data upon which to make observations that should be of value to the textile industries of this country. We may be able to learn from the efforts and experiences of other nations, in extending their trade to foreign countries, and be able to improve upon them, in many respects.

Belgium, it appears, has an important agency for the development of its foreign trade, in the excellence of organization and thoroughness of work of its chambers of commerce in different cities, particularly Antwerp. A similar line of policy has been carried out by a number of our own trade organizations, in the principal commercial markets, and by industrial organizations, notably the National Association of Manufacturers, of Philadelphia.

The policy pursued by Germany is one that has borne excellent fruit, and offers many points of merit deserving of our study. The government support towards its merchant marine has greatly helped in extending the foreign trade of that country. This support is extended in two ways, the direct and the indirect. The former consists of subventions allowed to two of the great lines running to Eastern Asia, including Australia and Eastern Africa. The indirect support is confined chiefly to remuneration for carrying the mails, under a system where the officers of the merchant marine become reserve officers of the regular navy. Last year, the Imperial Diet voted a sum toward sending industrial commissions to Eastern Asia, to discover new methods for the exploitation of German manufactures, very similar in its nature, we should judge, to the commission that is already traveling through the interior of China, under the auspices of the Commercial Muse-

ums, of Philadelphia. The immediate cause of the German commission is thought to be a desire to find new openings for trade, to make up for the comparative loss of the American market, due to the exactions of our tariff law.

Another method that is being pursued by Germany is that of making systematic exhibits of its manufactured products at the international expositions as they are being held. The experience of Germany in this respect has been looked upon as greatly advancing the growth of its domestic industries, and improving the character of its manufactures. To this end, that nation is preparing to make an extraordinary exhibition of its products at the coming Paris Exposition, which, it is reported, will show a remarkable progress since the exhibition that was held at Chicago, in 1893. The German government is also particular in having an intelligent and reliable corps of consular representatives in all countries where it desires to extend its trade. German success, which has characterized German foreign trade of late years, is alleged to be, by English authorities, due very largely to governmental aid, including bounties and subsidies, to "the superiority of her agents and exhibitors, her peculiar power of adapting goods to the requirements of foreign markets, and to her credit system."

The policy pursued by Great Britain is chiefly in the maintenance, unimpaired, of its over-sea possessions, and dependencies, and the protection, preservation and encouragement of its over-sea trade. The foreign policy of the government is largely, in a practicable way, towards the development of British trade in such ways as maintaining attaches at important trade centres, especially on the Continent. These officials are clothed with certain diplomatic powers, and have no duties devolving upon them, other than those implied by their title. One such official is stationed at Paris, his functions extending over France, Belgium, and Switzerland; another is stationed at Berlin, covering Germany, the Netherlands and Scandinavia; one at Madrid; and one at St. Petersburg. So well has this system operated on the Continent that preparations are being made to extend it to other parts of the commercial world. The recent innovations in the system instituted by Great Britain have been largely due to the encroachments upon British trade by Germany and the United States, as will be noted in a recent speech by Mr. Chamberlain, secretary of the Colonial office, in which he remarked: "It must be recognized that there is, and has been, for some time past, a combined assault by the nations of the world, upon the commercial superiority of this country; and if this assault becomes successful, our extension would be menaced in a way which it has never been threatened since the time of the great Napoleon."

As is well known, another potent agency for the extension of British trade is what has been popularly referred to as "subsidies," granted to English ships, being a system of payments made for carrying the mails to foreign ports. The primary object of these subsidies, which are not recognized in England under this name, is for the encouragement of the mercantile marine, which is necessary for the commercial and political welfare of Great Britain.

The French government has had no well defined policy, until within recent years, or since the passage of a law in 1893, covering the merchant marine and the royalties pertaining thereto, with direct reference to the extension of its foreign commerce.

Perhaps the most potent element for building up and extending the commercial relations of several of the European countries, is the earnest and substantial assistance that is being extended to technical education, in institutions especially devoted to this purpose, and aided in a direct and indirect way by the several governments.

Germany is acknowledged to be in the lead in this respect, and the great improvement in the quality of German manufactures is attributed to the successful efforts that have been made in this direction, and the display that will be made of the products of German factories at the coming Paris Exposition, it is expected will astonish the world. There are eight high schools for instruction, in Germany, which are supported by their respective state governments: Three in Prussia, one in Saxony, one in Hesse, one in Bavaria, one in Wurttemberg, and one in Baden. The result of this system of technical education has been the mental and manual training of a class of highly intelligent workmen, which have impressed their workmanship upon the manufactures of that country, so much so that it has attracted the attention of English manufacturers to the extent that a commission has been sent to Germany to inspect and report upon the conditions resulting from this system. This report was recently delivered at Manchester, England, making an unfavorable comparison between the skill of German and English factory hands, and even referring to the latter as comparatively "semi-savages."

The Prussian State appropriation for permanent investment in technical high schools, amounted, in 1897, to over $111,000. The schools outside of Prussia received proportionally about the same amount of aid. Among the technical and trade schools may be mentioned, as being of particular interest to our readers, the weaving and dyeing school of Crefeld, which is constantly being enlarged to meet the demands of the increased number of students and the advancement of science, and the weaving and dyeing schools at Aix and Cottbus. The result of this system of education has been that of revolutionizing the scientific industries of that country, outstripping even those of Great Britain. This is observed in the changed character of the workmen of Germany, who are, in most cases, scientific, as well as practically, educated, resulting in a greater perfection of work and efficiency in manual employment. This is commented upon by one of our consuls, to the effect that the great increase of the amount of German exports can be ascribed, in a large degree, to the technical and trade schools, which, in fact, have made Germany what she is, as a great manufacturing country. From every evidence, it appears that it is not so much the assistance of the general government to the industries of Germany, which has caused the remarkable progress in its manufactures, so much as the attention that has been given to the educational system upon which that country and its manufactures chiefly rely for their development.

## *MILL STATISTICS — CONNECTICUT AND MAINE.*

We have just received the late annual reports of the bureaus of labor statistics of the States of Connecticut and Maine, containing much interesting matter relating to the textile industries of those States.

CONNECTICUT COTTON MILLS.

| | Looms. | Spindles. | Pounds Cotton Used. | Value of Product. |
|---|---|---|---|---|
| 30 on cloth | 19,713 | 806,980 | 43,691,500 | $8,478,664.51 |
| 1 on cloth | 24 | – | – | 9,000.00 |
| 17 on yarn | – | 195,040 | 7,882,500 | 4,065,869.91 |
| 11 on webs, etc. | 793 | – | – | 2,135,000.00 |
| 1 on webs, etc. | 550 | 15,000 | 1,450,000 | 852,000.00 |
| 60 | – | 1,017,020 | 53,024,000 | $15,540,534.42 |

The Connecticut report enters upon the discussion of the cotton manufac-

turing industry with a recognition of the depression which has prevailed throughout the country for the past five years, as most materially affecting the industry of that State. Still, when we refer to the percentage table, we find that the cotton cloth mills of that State ran on the average of 94 per cent. of their full productive capacity, which would indicate that the mills kept their machinery in practically full operation during the year 1897, which is the one under consideration, regardless of the unprofitableness of the business. It is observed, however, that this average is sustained by the running to full capacity of the large mills of the State, while many of the small mills operated to only a portion of their capacity. This shows that it is much more difficult to regulate the operations of a large, than a small, concern, and adjust its running time to the conditions of the market. The total value of the products manufactured by the cotton, woolen, knit and silk mills of the State, amounted in 1897 to $38,546,797.66, and the wages paid amounted to $10,200,467.91, showing that 26.5 of the value of the product was paid in the form of wages. Accompanying this, we furnish statistics showing the number of looms, spindles, pounds of cotton used, and the value of the product of the cotton mills of the State. It will be observed that 17 of the 60 mills were devoted exclusively to the spinning of yarn, with over 19 per cent. of the total number of spindles, though consuming less than 15 per cent. of the amount of cotton used. The classification of our statistics, as herewith presented, differs somewhat from that given in the report, as more consistent, in our opinion, with the true condition of the industry. In fact, all of our tabulation is that of selection. The table giving the labor cost per spindle at $4.75, and the proportional number of men, women and children employed, may be read with interest. The consumption of cotton per spindle is apparently small, and is due, we should say, to the short running time, more than is indicated in the statistics of the report. The proportional number of children may be read with some profit, in connection with the table given further on, showing the hours of labor applied to minors, etc.

CONNECTICUT COTTON MILLS.

| | |
|---|---|
| Labor cost per spindle, for the year.. | $4.75 |
| No. spindles operated per employee.. | 65 |
| Consumption of cotton per spindle .. | 52.1 lbs. |
| Men employed, per cent..... | 43 |
| Women employed, per cent..... | 47 |
| Children employed, per cent..... | 10 |
| Tenement rents, per month .... | $ .90 to $11.00 |
| Wages, weavers ..... | $5.00 to $18.00 |
| spinners .... ..... | $4.00 to $12.00 |
| Tax on $1,000, assessed value..... | $14 20 |

It will be noted that the average tax on $1000 of assessed value is $14.20. The rate of assessment per spindle of cotton cloth mills is given at $9.32.

The woolen mills in Connecticut represent an invested capital of $6,906,000, and the assessed value of the property is $4,549,798, and the tax on $1000 of assessed value is $13. The accompanying table will furnish much valuable material for thought. The woolen mills of the State, for 1897, it appears, operated only to the extent of 78 per cent. of their full running capacity. The average use of 20 per cent. of wool substitutes in goods must, we suppose, be taken as characteristic of the average character of woolen goods manufactured in that State.

CONNECTICUT WOOLEN MILLS.

| | |
|---|---|
| Capital invested .... ... ..... .. | $6,906,000 |
| Assessed valuation of property..... | $4,549,798 |
| Tax on $1,000 of assessed value ..... | $13 |
| Average per cent. production of full capacity..... ... ..... .... | 78 |
| Average number of days operated.. | 244 |
| Average daily production per set of cards ..... | 197 lbs. |
| Average per cent. of clean wool used. | 80 |
| Average per cent. of shoddy, cotton, etc., used..... | 20 |
| Men employed, per cent..... .... .. | 62 |
| Women employed, per cent..... | 32 |
| Children employed, per cent ..... | 6 |
| Value of production..... | $11,887,227.67 |
| Weavers: | |
| Highest average weekly wages, | $12.04 |
| Lowest average weekly wages, | $5.50 |
| Spinners: | |
| Highest average weekly wages, | $12.00 |
| Lowest average weekly wages, | $4.75 |

Over $3,600,000 in value of knitted goods were turned out by the mills of Connecticut, in 1897. A large portion of those employed in these mills are women, and but a small portion children. The accompanying table con-

cerning knitting mills will furnish valuable information.

There were 25 silk mills in Connecticut in 1897, turning out a product of nearly $7,500,000, upon an invested capital of $4,008, 000.

CONNECTICUT KNITTING MILLS.

| | |
|---|---|
| Capital invested | $1,863,000 |
| Assessed valuation of property | $1,505,528 |
| Tax on $1,000 of assessed value | $14 00 |
| Value of production | $3,630,550.52 |
| Men employed, per cent | 30 |
| Women employed, per cent | 64 |
| Children employed, per cent | 6 |

In connection with the Connecticut report, a synopsis of the laws relating to the hours of labor and the employment of children is given. The information thus furnished, we have gone to the trouble of tabulating and verifying, comparing the statistics, in these respects, existing in the New England and Southern mills. We have found upon investigation that some of the statements made in the report are incorrect, regarding the employment of minors. We have made the necessary corrections in the table.

The report of the Maine Bureau of Labor statistics does not furnish such elaborate information as is to be found in the Connecticut report, concerning the textile industries. In the Maine

LABOR EMPLOYMENT.

| | Hours of labor. Per week. | Hours of labor applied to women; and to minors under | Hours of labor applied to minors under | All employment prohibited to minors under |
|---|---|---|---|---|
| Maine | 60 | 16 | - | 12 |
| New Hampshire | 60 | 18 | - | 10 |
| Vermont | 60 | - | 15 | 10 |
| Massachusetts | 58 | 18 | - | 14 |
| Rhode Island | 60 | 16 | - | 12 |
| Connecticut | 60 | 16 | - | 14 |
| Tennessee | - | - | - | 12 |
| Georgia | 66 | - | - | - |
| South Carolina | 66 | - | - | - |

report, only 10 of the 16 cotton mills in the State made complete returns. From the figures furnished by the ten mills, it appears that these operated, in 1897-98, to the extent of 90.8 per cent. of their full capacity, and, of the average number of hands employed, 41 per cent. were men, 52 per cent. women, and 7 per cent. children.

Of the 22 Maine woolen mills making returns, it appears that they were operated to the extent of 95.6 per cent. of their full running capacity, and, of the average number of hands employed, 67 per cent. were men, 32 per cent. women, and only one per cent. children under 16 years of age. Referring to child labor in the Maine mills, a significant fact is strongly developed in the marked increase of child labor in the cotton mills; that is, while 630, under 16 years of age, were employed in the year 1897, 788 were employed in the year 1898. This is alluded to with some comments by the inspector of factories, in his report. Another matter alluded to by the inspector is the strong tendency toward the displacement of male help by female adult and child help, in cotton mills. Another thing touched upon, is that in the large manufacturing centres, as Lewiston, Biddeford and Saco, the adult male and female operatives are largely foreign born, or of foreign parentage, and that as a rule these operatives are the parents of numerous families of children, varying in age from five to 18 years. The inspectors have much more trouble with the parents than with the mills, in keeping children under age from entering factory employment.

## *RETROSPECTIVE AND PROSPECTIVE.*

This has been one of the epoch making years in the history of the United States, which will involve changes in national policies and establish new relations of the country with others, politically and commercially. The future cannot be well foretold, but it is certain that we have entered upon a career that will bring us more in contact with the methods of Europe, in their relation to Asiatic and other nationalities, than ever before. The result of our war with Spain is destined to have nearly as much effect

upon the future policies of European countries as upon our own. One of the most satisfactory outcomes of our troubles with Spain is the unification of the English speaking people, which in time will give to this people the control of the world, and bring it under a new civilization. A great evolution has taken place in this respect, as it was only three years ago that the two great branches of the English speaking family were upon the verge of war, while now they are in the embrace of the closest friendship. This is one of the greatest triumphs of the age.

The material progress of this country has been immense within the last twelve months, as noted in the volume of our export trade, being beyond all precedent, the amount of bank clearances, showing the volume of trade, the large earnings of transportation companies, and the unprecedented movement of speculative interests. Nothing has before equalled this in the history of the country. The new year opens with the outlook for all branches of business extremely favorable for a season of great prosperity. Previous business experience has been thrown completely into the shade, notably that relating to the iron and steel industry, in which the greatest production ever known has been made, and which is now entering into consumption, to meet the domestic, as well as the foreign, demand. The only apparent drawback is that relating to the manufacturing and wholesale trade in the eastern part of the country, as not so favorable as was at first expected would be the case, due to extraneous causes and to disturbing elements arising from the war with Spain.

One of the principal reasons for the prosperity that has characterized the business of the country for 1898, is the large production and demand for the cereal products of our western States. A vast amount of money has come to this country from abroad to pay for large exportations of wheat, both in 1897 and 1898, which has been most sensibly felt by the agricultural classes and transportation companies. This demand for wheat is likely to continue for the present year, at least, when it is considered that the deficiency in importing countries is reckoned at 448,600 bushels, for which there is only an available supply from export countries, of 389,730 bushels, showing a shortage in this respect, notwithstanding the total crops are larger than they were last year.

All things considered, the number of failures and amount of liabilities for 1898 must be looked upon as showing a favorable condition of business affairs. The commercial failures for 1898 numbered 12,186, with liabilities at $130,662,899, against 13,351 and $154,332,071, for 1897, respectively. Though the number of manufacturing failures for the whole country was less in 1898 than in 1897, for New England, alone, it was more, with a slight increase in the amount of liabilities. New England was the only section unfavorably affected in this respect. The manufacturing comparison is the least favorable, owing to some large failures that occurred in the latter part of the year, mainly in the woolen and machinery branches. The woolen industry, in the textile line, suffered the most, showing the number of failures in 1898, of 46, against 39, for 1897, and liabilities of $6,428,700, against $1,491,360, respectively. The showing for 1898, however, in the matter of liabilities, is better than for 1896, when they amounted to nearly $8,400,000. It is noted, however, that about 40 per cent. of the amount of liabilities occurred in the month of December, the largest failure being that of the Assabet Manufacturing Company.

The cotton industry, on the other hand, made a more favorable comparison in 1898, with previous years, showing but 26 failures, with liabilities amounting to $2,016,573. Of the 46 failures in the woolen industry, with the total liabilities as above stated, ten of these were with liabili-

ties of $5,714,000. This is in line with the important influence of large failures during the year.

The cotton manufacturing industry began the year of 1898 unfavorably in all departments, with poor business and large stocks on hand, though the prospects seemed to be at that time favorable for a development of a healthy demand, which would have manifested itself more satisfactorily had it not been for the war with Spain, which exerted a restrictive influence. The increasing decline in the price of the raw material also was prejudicial to the manufacturing interests. There was, however, a spasmodic demand for cotton fabrics for army and navy purposes, such as drills, ducks, ticks, sheetings, etc., which forced a number of mills to run over time. On the whole, however, prices were downward, in sympathy with the decline in the price of cotton. The most important feature in cotton manufacturing was that relating to the print cloth market, which, at the beginning of the year, showed a combined stock of goods on hand, of 2,400,000 pieces, composed of wide and narrow goods in various counts, including sateens, plain goods and twills. The year opened at 2¼ cents for regular, 64 by 64, print cloths, with a gradual decline till the price reached 1⅞ cents, in May. This depression resulted in clearing the market and improving its tone, so that by the close of the year it was practically bare of the staple grades, with the price advanced to 2⅜ cents, in December. The highest price during 1898, for print cloths, was 2⅜ cents, and the lowest, 1⅞ cents, with the average at 2.06 cents.

The new plan of selling and pooling, under the management of trustees, which was inaugurated in October for disposing of the print cloth production, has proved, thus far, a wise one. The plan was one that was first talked of as long ago as 1873, but no unity of action upon the part of the mills was ever accomplished, until last October. The year opened with the price of standard brown sheetings at 4¾ cents, and closed with the price at 4½ cents. Some classes of cotton goods, however, were higher at the close, than at the beginning of the year, notably wide sheetings, 10/4 bleached, 4/4 fine brown sheetings, and ginghams.

The woolen industry had a particularly bad year in 1898, but the prospects for 1899 are much more favorable, and there is a general feeling that manufacturers will do well. This refers not only to the cloth, but to the knitting, branch. There is no expectation that prices will show any advance, but the demand has every evidence of substantially and permanently improving. One good feature that is noticed with the opening of the present year is a greater demand for better goods than was experienced in the early part of 1898. All wool fabrics are now sought for, to the exclusion of the poorer classes of cloths that were offered last year. Prices for woolen goods were on the average less at the end, than at the beginning, of the year. Some few lines, however, were higher, such as fancy cassimeres, 14 to 16 ounces, and some lines of flannels. The woolen industry would have had a good year in 1898, had it not been for the unexpected wholesale cancellation of orders in the early months, leaving many of the mills with contracts on hand and an unsold stock of goods.

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—The process of dyeing in colonial days required much skill and care. The housewife fully appreciated the homely saying, "dyed in the wool," as it was often her daily task. She was skilled in the use of various dyes, which wool took easily, and the coloring was rich and beautiful. There were many shades from which to choose. While flax only took well in two shades, indigo and oxide of iron, wool was easily colored in as many shades as the colonial housewife desired.

# THE TEXTILE WORLD'S ANNUAL REPORT OF MILL CONSTRUCTION FOR 1898.

We give, herewith, our usual annual report of the statistical status of textile mill construction for 1898.

In our list of new mills, we have included only such as have been put in operation during the year, or are so far completed that they will begin operation within the first few months of 1899. Our list of projected industries includes the mills which are being constructed or contemplated, and will begin production later in the year.

COMPARISON OF NEW MILL CONSTRUCTION WITH FORMER YEARS.

| | 1898 | 1897 | 1896 | 1895 |
|---|---|---|---|---|
| Cotton | 34 | 49 | 66 | 59 |
| Woolen | 25 | 53 | 31 | 33 |
| Knitting | 46 | 71 | 85 | 80 |
| Silk | 19 | 43 | 17 | 10 |
| Miscellaneous | 10 | 14 | 8 | 16 |
| | 134 | 230 | 207 | 198 |

The number of new mills that were constructed in 1898 was much less than in 1897, and less than in any year since 1894. All industries suffered in this respect, indicative of the generally unsatisfactory condition of textile manufacturing. A somewhat hopeful feeling seems to be indicated in the increased number of mills projected for the current year; the number standing at 50 against 33 for 1897.

PROJECTED MILLS IN 1898 AS COMPARED WITH 1897 AND 1896.

| | 1898 | 1897 | 1896 |
|---|---|---|---|
| Cotton | 28 | 15 | 47 |
| Woolen | 8 | 8 | 7 |
| Knitting | 12 | 7 | 17 |
| Silk | 1 | 3 | 5 |
| Miscellaneous | 1 | 0 | 3 |
| | 50 | 33 | 79 |

| | *South.* | *N. E.* | *Elsewhere.* | *Total.* |
|---|---|---|---|---|
| Cotton | 28 | 0 | 0 | 28 |
| Woolen | 2 | 1 | 5 | 8 |
| Knitting | 8 | 0 | 4 | 12 |
| Silk | 0 | 0 | 1 | 1 |
| Miscellaneous | 0 | 0 | 1 | 1 |
| | 38 | 1 | 11 | 50 |

This is manifested more in the cotton and knitting, than in the other industries. As will be observed, there are no cotton mills projected for 1899, in the New England States, and of the total of 28, all are for the Southern States; nine in Georgia; six in North Carolina; five in South Carolina; one in Mississippi; two in Virginia; and five in Texas. Thirteen of these 28 mills are for the spinning of yarn.

NEW COTTON MILLS.

| | *No.* | *Spindles.* | *Looms.* |
|---|---|---|---|
| Alabama | 3 | 30,000 | 800 |
| Arkansas | 1 | 3,000 | 10 |
| Georgia | 6 | 57,500 | 1,070 |
| North Carolina | 8 | 31,250 | 600 |
| South Carolina | 8 | 37,000 | 560 |
| South | 26 | 158,750 | 3,040 |
| Massachusetts | 1 | – | 10 |
| Rhode Island | 1 | – | – |
| New Hampshire, | 1 | – | 600 |
| New York | 1 | 5,000 | – |
| Pennsylvania | 3 | – | 50 |
| Kansas | 1 | 2,000 | – |
| North | 8 | 7,000 | 660 |

COMPARISON OF SPINDLE GROWTH WITH FORMER YEARS.

| New England. | 1898 | 1897 | 1896 | 1895 |
|---|---|---|---|---|
| New Mills | – | 35,840 | 240,352 | 211,662 |
| Enlargements | 10,000 | 31,240 | 4,560 | 66,156 |
| Southern States. | | | | |
| New Mills | 158,750 | 256,780 | 382,045 | 493,280 |
| Enlargements | 159,624 | 150,094 | 42,000 | 152,800 |
| Middle and Western States. | | | | |
| New Mills | 7,000 | 4,000 | 24,000 | – |
| Enlargements | – | – | 10,000 | 14,000 |
| | 235,374 | 477,954 | 702,957 | 937,898 |

Number of Spindles in New Mills, 1898 . . . . . 165,750

" " " " Enlargements, 1898 . . . . . 169,624

NEW WOOLEN MILLS.

| | | |
|---|---|---|
| New England. | | |
| Maine | 3 | |
| Massachusetts | 7 | |
| Vermont | 1 | =11 |
| Middle States. | | |
| New York | 2 | |
| New Jersey | 2 | |
| Pennsylvania | 4 | = 8 |
| Western States. | | |
| Michigan | 1 | |
| Minnesota | 1 | |
| Illinois | 1 | = 3 |
| Southern States. | | |
| South Carolina | 1 | |
| Virginia | 2 | = 3 |
| | | 25 |

Only one woolen mill is projected for New England, and that one a small concern to be located in a leased building, and two in the South (North Carolina and Tennessee), for the manufacture of union goods, etc., presumably for local consumption. Eight of the twelve knitting mills projected are in the Southern States, in which cotton yarns will be used.

Nearly all the increase in the number of cotton spindles in old mills took

NEW KNITTING MILLS

| | | |
|---|---|---|
| New England. | | |
| Massachusetts | 3 | |
| Connecticut | 1 | |
| Rhode Island | 3 | = 7 |
| Middle States. | | |
| New Jersey | 1 | |
| New York | 7 | |
| Pennsylvania | 15 | =23 |
| Western States. | | |
| Indiana | 1 | |
| Michigan | 2 | |
| Minnesota | 1 | |
| Ohio | 1 | = 5 |
| Southern States. | | |
| Georgia | 7 | |
| North Carolina | 3 | |
| Texas | 1 | =11 |
| | | 46 |

place in the Southern States, mostly in South Carolina, where 97,600 spindles were added; 30,560 spindles in North Carolina, and 19,000 in Georgia. Only 10,000 spindles were added in New England. One cotton mill in California increased its capital from $600,000 to $800,000. Of the three new cotton mills credited to New England, two were additions to present plants, and the other a small concern for the manufacture of Turkish, fancy cotton and linen huck towels, and cotton and linen crashes. Of the 26 new cotton mills in the Southern States, fourteen, with 75,750 spindles, nearly half of those put into new enterprises, were for spinning. Of the four new mills constructed in the Middle States, three

NEW MISCELLANEOUS MILLS.

| | | |
|---|---|---|
| Rhode Island. | | |
| Pyralin for Waterproofing | 1 | |
| Vermont. | | |
| Linen | 1 | |
| New Jersey. | | |
| Bleachery | 1 | |
| Dyeworks | 1 | |
| Linen | 1 | = 3 |
| New York. | | |
| Linen | 1 | |
| Haircloth | 1 | = 2 |
| Pennsylvania. | | |
| Dyeing | 1 | |
| Michigan. | | |
| Flax | 1 | |
| Missouri. | | |
| Bags | 1 | |
| | | 10 |

were small ones for the manufacture of upholstery goods, narrow fabrics and damask; and one small mill for the spinning of yarn. A small mill of 2000 spindles for yarn was constructed in Kansas.

None of the mills constructed in 1898 was of large capacity. The most notable feature in the construction of new woolen mills was the erection of a carpet mill at Gaffney, S. C., for the manufacture of cotton, wool and

NEW SILK MILLS.

| | | |
|---|---|---|
| Rhode Island. | | |
| Silks and Satins | 1 | |
| New Jersey. | | |
| Tie Silk and Ribbons | 1 | |
| Broad Silks and Specialties | 1 | |
| Dress Goods | 1 | = 3 |
| New York. | | |
| Yarns | 1 | |
| Broad Silks | 1 | = 2 |
| Pennsylvania. | | |
| Broad Silks and Ribbons | 5 | |
| Ribbons and Novelties | 5 | |
| Throwing | 2 | |
| Satins, Armures, etc. | 1 | =13 |

worsted ingrain carpets and art squares, with a capital of $60,000.

Twenty-six of the knitting mills constructed in 1898 were for hosiery; two for mittens, gloves, etc.; one for the manufacture of such goods as elder down; and the remainder chiefly for underwear.

# ANNUAL REPORT

—OF—

# NEW MILL CONSTRUCTION

## During 1898.

EXPLANATION OF ABBREVIATIONS: 12/98=December, 1898, etc.; S=Steam; W=Water Power; E=Electricity; D=Dye House.

## NEW MILLS.

| COTTON. | Date of Starting. | Number of Employees. | Spindles. | Looms. |
|---|---|---|---|---|
| **ALABAMA.** | | | | |
| Alabama City. Dwight Mfg. Co. New mill | 4/99 | 500 | 25,000 | 806 |
| Mobile. Mobile Cotton Mills. $100,000. Yarns, 8's to 20's. (S) (Commenced construction Dec. '98.) | 5/99 | 75 | 5,000 | .. |
| Tuscaloosa. Tuscaloosa Wadding Co. $25,000. Cotton Wadding | 9/97 | 50 | .. | .. |
| **ARKANSAS.** | | | | |
| Little Rock. The Thomas Cotton Mill. Yarns, carpet warps, etc. (S) | 10/98 | 85 | 3,000 | 10 |
| **GEORGIA.** | | | | |
| Cedartown. Paragon Mills. $50,000. Hosiery and underwear yarns. M. O. Berry, president. A. W. Birbeck, treasurer. (S) | 12/98 | 300 | 10,000 | .. |
| Commonwealth. The Christian Commonwealth. New mill. Towels, denims, gray goods, etc. | 1/99 | 25 | .. | 20 |
| Covington. Porterdale Mills. New yarn mill, in addition to present plant | 1/99 | 400 | 15,000 | .. |
| Dalton. Crown Cotton Mills No. 2. Cotton duck | 4/99 | 400 | 10,000 | 250 |
| Lindale. Massachusetts Cotton Mills. New mill to be erected at cost of $600,000. Under construction | 4/99 | 500 | 20,000 | 800 |
| Whitehall. Whitehall Yarn Mill. John R. White, proprietor. Yarns 10's to 20's, single and double. (S) | 1/99 | 40 | 2,500 | .. |
| **KANSAS.** | | | | |
| Independence. Kansas Cotton Mill Co. $25,000. Wrapping twines, carpet warps and yarns. (S) Under construction | 5/99 | 50 | 2,000 | .. |
| **MASSACHUSETTS.** | | | | |
| Lawrence. Sultan Mills. C. T. Daniels, proprietor. Turkish towels, fancy cotton towels, linen huck towels, and cotton and linen crashes | 8/98 | 20 | .. | 10 |
| **NEW HAMPSHIRE.** | | | | |
| Nashua. Nashua Mfg. Co. New mill 100 x 300 feet. 2 stories. For weaving. (Under construction.) | 4/99 | 100 | .. | 600 |
| **NEW YORK.** | | | | |
| Cohoes. John H. Murphy Mfg. Co. Cop yarn | 10/98 | 65 | 5,000 | .. |
| **NORTH CAROLINA.** | | | | |
| Albermarle. Wiscassett Mills Co. $250,000. J. W. Cannon, president. John C. Leslie, secretary. Yarns | 4/99 | 120 | 6,000 | .. |
| Chapel Hill. Thomas F. Lloyd. Yarns, about No. 30's average on warps, cones, tubes or hanks. (Under construction.) | 5/99 | 75 | 5,000 | .. |
| Concord. Lippard & Shealy Cotton Mfg. Co. $50,000. D. B. Coltraine, president. J. C. Lippard, secretary and treasurer. W. P. Shealy, manager and superintendent. Twisted yarn. Mill 150 by 50, one story | 2/99 | 75 | 3,000 | .. |

## COTTON—Continued.

| | Date of Starting. | Number of Employees. | Spindles. | Looms. |
|---|---|---|---|---|
| **NORTH CAROLINA—continued.** | | | | |
| Henderson. Henderson Cotton Mills. New building 72 x 75, 2 stories, in addition to present plant. Cone yarns and sheetings. (Under construction.) | 3/99 | 50 | 3,000 | .. |
| Kinston. Kinston Cotton Mills. $59,000. W. C. Fields, president. J. F. Taylor, treasurer and agent. S. W. Oliver, superintendent. Hosiery yarns, 8 to 22 | 11/98 | 75 | 3,250 | .. |
| Norwood. Norwood Cotton Mills. $50,000. D. W. Coltraine (Concord, N. C.), president. J. A. Tyson (Norwood, N. C.), secretary and treasurer. Yarns | 1/99 | 100 | 5,000 | .. |
| Rockingham. Pee Dee Mfg. Co., Mill No. 2. Manufacture plaids | .. | 250 | 6,000 | 300 |
| Spray. Nantucket Mills. $250,000. J. M. Worth, president. J. S. McAlister, treasurer. Weaving only. (W D) | 11/98 | 125 | .. | 300 |
| **PENNSYLVANIA.** | | | | |
| Philadelphia. Anderson & Turnier Co. New mill erected, cor. Mascher and Oxford Sts. Curtain and upholstery goods | 10/98 | .. | .. | 20 |
| Philadelphia. Krout & Fite Mfg. Co. New mill. Allegheny Ave. and Emerald St. Lace edgings, cotton braids, spool tapes, silk and cotton narrow fabrics. (S B) 10 new knitting machines | 10/98 | 100 | .. | 30 |
| Philadelphia. Wall & Davies. Aramingo Mills, Frankford. Turkey-red damasks | 11/98 | .. | .. | .. |
| **RHODE ISLAND.** | | | | |
| Pawtucket. Blodgett & Orswell Co. New mill in addition to present plant. 178 by 46, 4 stories and boiler house 52 by 24 | .. | .. | .. | .. |
| **SOUTH CAROLINA.** | | | | |
| Columbia. Palmetto Cotton Mills. $125,000. Fancy cottons. I. R. Hayes, agent | 4/99 | 250 | 9,000 | 250 |
| Edgefield. Edgefield Mfg. Co. New mill | 9/98 | 125 | 3,000 | 150 |
| Fountain Inn. Fountain Inn Mfg. Co. $75,000 J. W. Shell, president. P. C. Poag, secretary and treasurer. Cotton yarns. (To add 3,000 more spindles later.) | 4/99 | 75 | 3,000 | .. |
| Greer Depot. Brooks Mfg. Co. $25,000. E. S. Brooks, president and manager. Batting | .. | .. | .. | .. |
| Lando. Manetta Mills. B. D. Heath, president. J. C. Gregson, treasurer and superintendent. Hosiery yarns. (Under construction.) New mill replacing one destroyed by fire. Previously made warp yarn | 4/99 | 150 | 7,000 | .. |
| McColl. Marie Cotton Mfg. Co. $50,000. T. B. Gibson and others. (Under construction.) | 5/99 | 100 | 5,000 | .. |
| Waterboro. Colleton Cotton Mills. $100,000. C. Shoffer, president. John T. Lucas, treasurer. Yarns, threads and white goods | 3/99 | 150 | 5,000 | 160 |
| Yorkville. T. B. McClain. Hosiery yarns, 10's to 20's. (S). Purchased building and is equipping same | 3/99 | 100 | 5,000 | .. |

## WOOLEN.

| | Date of Starting. | Number of Employees. | Date of Start-width cards. | Looms. |
|---|---|---|---|---|
| **ILLINOIS.** | | | | |
| Chicago. Armour & Co. Piano, insulating and tailoring felt, and felt boots. H. P. Darlington, manager | 8/98 | 300 | 12 | .. |
| **MAINE.** | | | | |
| Corinna. Chas. A. Greenwood. Cassimeres. Main building 80 by 45. Picker and boiler houses separate structures. (Erected in place of ones destroyed by fire July 7th/98.) (W D) | 1/99 | 40 | 3 | 16 |
| Old Town. Ounegan Woolen Co. John Cassidy, president. N. H. Brown, treasurer. (Mill to be erected winter of 98-99.) | 5/99 | 50 | 4 | 25 |
| Phillips. Phillips Woolen Co. $10,000. (W D). (New mill on site of burned plant operated by Hescock & Atwood.) | 10/98 | 10 | 1 | 2 |
| **MASSACHUSETTS.** | | | | |
| Byfield. Byfield Woolen Co. New mill, 50 by 100 feet, 4 stories. Manufacture felt goods. New cards, looms, spinning and finishing machinery installed | 2/99 | .. | 5 | 35 |
| Lawrence. Hampshire Worsted Co. $4,500. Jacob C. Nash, treasurer. E. S. Creamer, agent. Men's worsted suitings | 5/98 | 15 | .. | 8 |
| Mendon. Geo. R. Whiting. New mill built to take place of one burned August, '98. Capacity increased. Also addition to picker house | .. | .. | .. | .. |
| North Adams. R. E. Schouler. Fancy worsteds. So. Ashland St. | 1/99 | 10 | .. | 5 |
| Stoughton. Stoughton Woolen Co. $50,000. Shoddy. (New mill under construction.) | 12/98 | 50 | .. | .. |
| West Millbury. Millbury Scouring Co. New building and new machinery to take place of plant destroyed by fire June 28 | .. | .. | .. | .. |
| Worcester. L. L. Brigham & Fred A. Lapham. Woolens. Second floor of Speirs' bicycle plant on Nebraska St. | 2/99 | 25 | 1 | 12 |
| **MICHIGAN.** | | | | |
| Eaton Rapids. Eaton Rapids Woolen Mills. New building 70 by 107, 2 stories. Woolen and merino knitting and weaving yarns. (S & W) | 1/99 | 20 | 2 | 10 |
| **MINNESOTA.** | | | | |
| Fosston. Woolen mill. Claude Neilson. $15,000 | 2/98 | 20 | 2 | 10 |
| **NEW JERSEY.** | | | | |
| Camden. Benj. F. Boyer & Sons. Mill 60 by 100 ft. on Delaware Ave. and Cooper St. Worsted yarns. French system | 12/98 | .. | .. | .. |
| Hightstown. Hightstown Smyrna Rug Co. New mill. (Reincorporation of J. H. Cook & Co. of Janvier.) $50,000. Smyrna rugs | 9/98 | 50 | .. | 20 |
| **NEW YORK.** | | | | |
| Amsterdam. Amsterdam Woolen Co. J. F. Hapworth, manager. Woolen goods for men's wear. (W S & D) | 3/99 | 100 | 4 | 30 |
| Newburgh. Plattekill Felting Co. $25,000. Felts. William Foster, president. James S. Taylor, treasurer. K. J. McLeod, superintendent | 3/98 | 17 | 2 | .. |
| **PENNSYLVANIA.** | | | | |
| Apollo. Apollo Woolen Mill. Mr. Flynn, manager. Yarns, blankets and flannels | 10/98 | 30 | 2 | 12 |
| Langhorne. Frederick Rumpf & Son. (Phila.) New mill. Woolen goods. (S) | 8/98 | .. | .. | .. |
| Philadelphia. Barr Maufacturing Co. 4th & Somerset Sts. Cotton-worsted for men's wear | 9/98 | 30 | .. | 72 |
| Troy. The Northern Woolen Mfg. Co. $75,000. (Formerly C. J. Marble & Sons of Condersport.) Yarns and blankets. (S & D). New mill under construction | 2/99 | .. | 2 | 6 |
| **SOUTH CAROLINA.** | | | | |
| Gaffney. Gaffney Carpet Mfg. Co. $60,000. J. E. Bierck president, treasurer and superintendent. H. F. Gaffney, secretary. Cotton, wool and worsted ingrain carpets and art squares. (D) | 6/98 | 150 | .. | 59 |
| **VERMONT.** | | | | |
| Bennington. Wm. Campbell. Purchased mill at Bennington Falls, and is converting same into yarn mill to supply yarns for knitting plant | 3/99 | 75 | 6 | .. |
| **VIRGINIA.** | | | | |
| Jack's Mill. John T. Price. Woolen yarn, linseys and blankets. (W) | 7/98 | 6 | 1 | 3 |
| Winchester. C. A. Williams & Bros. New mill erected in place of one destroyed by fire. Prison and reformatory goods. (S & W D) | 8/98 | 25 | 1 | 8 |

## KNIT.

| | Date of Starting. | Number of Employees. | No. Kig. Mchs. |
|---|---|---|---|
| **CONNECTICUT.** | | | |
| Newington. Novelty Knitting Co. $25,000. Children's plaid stockings, knit shawls, baby carriage robes and athletic goods | 1/98 | 150 | .. |
| **GEORGIA.** | | | |
| Athens. Dootson, Jas. H. (Wm. Dootson and J. H. Hodgson, interested); Underwear and Hosiery. (W) | 2/98 | 40 | 40 |
| Atlanta. Atlanta Hosiery Mill. S. A. Magill, proprietor. Hose and men's half hose. Burned Jan. '98. Rebuilt | 6/98 | 40 | 40 |
| Barnesville. Oxford Knitting Mills. $15,000. Cotton underwear, (S) New addition 30 by 50 completed in Sept. and new machinery installed | 10/98 | 30 | 20 |
| Cedartown. Wahneta Knitting & Hosiery Mill. Underwear and hosiery. Geo. H. Wade, superintendent | 1/99 | .. | .. |
| Hampton. Henderson Mfg. Co. $10,000. Ladies' fine ribbed underwear. (S) | 7/98 | 25 | 12 |
| Molena. James Brooks. Hosiery. (Under construction.) | 1/99 | 10 | 10 |
| Stone Mountain. Annestown Cotton Mills. Hosiery | 11/98 | 25 | 20 |
| **INDIANA.** | | | |
| Fort Wayne. United Knitting Mills. $3500. Men's, women's, misses' and boys' full fashioned ribbed hosiery. (E) | 12/98 | 150 | 70 |
| **MASSACHUSETTS.** | | | |
| Boston. Smith, L. C., 520 Harrison Ave. Infant's hosiery | .. | .. | 20 |
| New Bedford. Cornell Stocking Co. $29,000. Hosiery. James P. Francis, president; Joseph C. Nowell, treasurer | 12/98 | .. | 30 |
| Northampton. McCallum Hosiery Co. New mill. (Under construction | .. | .. | .. |
| **MICHIGAN.** | | | |
| Detroit. Friedman, Forrester & Co., 40-46 Champlain St. Ladies', Misses', infants', men's and boys' mittens, gloves and hosiery. (S) | 1/99 | 200 | 175 |
| Quincy. Quincy Knitting Co. $12,500. Mittens, leggins, etc. (S D) | 12/98 | 25 | 15 |
| **MINNESOTA.** | | | |
| Duluth. Nelson Bros. New mill, 1804 W. Superior St. Sweaters, cardigan jackets, woolen and worsted yarns | 5/98 | 10 | 8 |
| **NEW JERSEY.** | | | |
| Jersey City. 48 Tuers Ave. Geo. Mueller & Co. (79 Walker St.) Agents new company. R. Sonderhoff, supt. | 2/99 | .. | .. |
| **NEW YORK.** | | | |
| Arcade. Fashion Knitting Mill. New building 58 by 80 feet, 4 stories, brick. (Branch of plant at Buffalo) | 9/98 | 50 | 20 |
| Cohoes. Victor Knitting Mills. New mills. One 68 by 107 feet, 6 stories; other 31 by 83, 9 stories. Also picker-house, 28 by 68, 2 stories. Jersey ribbed goods. (S & W). (Built on site of plant destroyed by fire) | 1/99 | 1000 | 120 |
| Fishkill-on-the-Hudson. J. H. Murphy & Co. (Cohoes, N. Y.) New mill. Men's and women's ribbed underwear | 1/98 | 175 | 61 |
| Fort Plain. Diana Knitting Mills. Geo. A. Vosburgh. Ladies' ribbed underwear in lisle, silk, worsted and Egyptian. (S) | 9/98 | 75 | 16 |
| Phoenix Mills. Index Knitting Mills. Mill No. 2. Spinning yarn and underwear | 2/99 | 100 | 15 |
| St. Johnsville. Royal Knitting Co. J. H. Reaney, proprietor. Ladies', misses' and children's underwear. Leased another building | 3/98 | 250 | 75 |
| Utica. Capron Knitting Mill Co. (Capron, N. Y.) Purchased land here and will remove plant to this place as soon as new building is completed | .. | .. | .. |
| **NORTH CAROLINA.** | | | |
| Gibson. McAlwinn & Deaton. Rebuilding plant recently destroyed by fire. Mill 75 by 100. (Not yet decided whether knitting or other machinery will be installed.) | .. | .. | .. |
| Scotland Neck. M. A. Smith Manufacturing Co. Ladies' and children's ribbed hose, also half hose. (S) | 5/98 | 75 | 60 |
| Weldon. Knitting Mill. $25,000. W. E. Daniel and W. T. Shaw, interested. Low and medium grade underwear. (W D) (Under construction.) Expected to begin operations in March, '99 | .. | 120 | .. |
| Winston. T. J. Wilson. Ladies' vests | 9/98 | 10 | 4 |
| **OHIO.** | | | |
| Dresden. Kapner Bros. & Duga Hosiery Co. (New mill to take place of one destroyed by fire.) Cotton and woolen hosiery. (D) | 12/98 | 150 | 75 |
| **PENNSYLVANIA.** | | | |
| Cressona. Beck Hosiery Co. $5,000. Ladies' fine seamless hosiery (S) | 11/98 | 20 | 22 |
| Downington. Walker-Evans Knitting Co. Ladies' hosiery. (S) (Mill at East Downington.) | 2/98 | .. | 16 |
| Duncannon. I. W. Forry & Son (of Shamokin and Myerstown). New hosiery mill | 1/99 | 200 | 100 |
| Hummelstown. W. H. Ulrich, Joseph Rhoades and Adam Knull. Building 26 by 60, 2 stories. Hosiery | 1/99 | 50 | 30 |

## KNIT—Continued.

| | Date of Starting. | Number of Employees. | No. Ktg. Mchs. |
|---|---|---|---|
| PENNSYLVANIA—continued. | | | |
| Lititz. Lititz Springs Knitting Mills. H. S. Kauffman and F. W. Briggs. Ladies' underwear. Gasolene engine | 6/98 | .. | 8 |
| Lykens. Fisher & Jones. $7,000. Cotton half hose (S) | 6/98 | 25 | 20 |
| Mahanoy City. Jones & Johnson. Eagle Hosiery Mill. Ladies' and men's full seamless hose and misses' hose (S D) | 4/98 | 150 | 152 |
| Middletown. H. A. Romberger (Phila.). Seamless half hose and ladies' hose | 7/98 | 100 | 50 |
| Nanticoke. Black Diamond Knitting Mills Co. $15,000. Thomas West, treasurer. Geo. West, mgr. Seamless half hose. Capacity 600 doz. per day | 3/98 | 125 | 100 |
| Philadelphia. Linton Hosiery Mills. R. M. Linton, proprietor. 726 Girard Ave. Cotton hosiery | 5/98 | .. | .. |
| Pottstown. Wismer, Heistand, Booth & Co. New mill. (Plant moved here from Parkerford.) (To increase to 50 machines and operatives.) | 11/98 | 20 | 14 |
| Reading. Eagle Knitting Mills. J. G. Frederick, proprietor. New mill, corner 11th and Greenwich Sts. Fine seamless half hose and ladies' hose. (S D) | 12/98 | 70 | 40 |
| Shamokin. Shamokin Valley Knitting Mills. (Ressler & Co.) Seamless hosiery. (S) (Leased Lincoln St. Hall.) | 1/98 | 70 | 40 |
| Steelton. Steelton Hosiery Factory. Frank T. McElroy, proprietor. Half hose | .. | 12 | 6 |
| Tower City. Boyer, D. A. Ladies' hose | .. | .. | 7 |
| RHODE ISLAND. | | | |
| Woonsocket. O. D. Banfill, Cass Ave. Elderdown and stockinettes.. | .. | 12 | 8 |
| Woonsocket. U. S. Rubber Co. Knit and felt boots and fleece linings. 10 sets | .. | 200 | 40 |
| Woonsocket. Woonsocket Fine Hosiery Co. Hosiery | .. | .. | 3 |
| TEXAS. | | | |
| Cuero. Burgoyne Fish and others. Ladies' and Men's hose. (D) .... | 4/98 | 8 | 5 |

## SILK.

| | Date of Starting. | Number of Employees. | Spindles. | Looms. |
|---|---|---|---|---|
| NEW JERSEY. | | | | |
| Belvidere. Bamford Bros. Silk mill, 2 stories. (Under construction.) | .. | .. | .. | .. |
| Paterson. Audiger-Meyer Silk Co. $100,000. Tie silk and ribbons. Julius Meyer, president. Walter H. Graef, treasurer | .. | .. | .. | 200 |
| Paterson. Cornforth and Marx. New building in addition to present plant. Broad silks, tie and dress silks and specialties. (S) | 7/98 | 50 | .. | 20 |
| NEW YORK. | | | | |
| Delhi. Gallant Bros. (of Paterson, N J.) New mill erected 100 by 150, one story, and building for spinning and warping, 2 stories, 160 by 55. (Branch of Paterson plant.) | 11/98 | .. | .. | .. |
| Elmira. J. N. Stearns & Co. (New York City) to remove plant to Elmira. New mill to be built | .. | .. | .. | .. |
| PENNSYLVANIA. | | | | |
| Allentown. Rioner Silk Co. Broad silks and ribbons, also throwing. New mill 52 by 150, 2 stories. Engine and boiler houses separate. (Under construction.) | .. | 200 | .. | .. |
| Coatesville. Ashley & Bailey. (Paterson, N. Y. and Columbia and Marietta, Pa.) New mill 300 by 52, 3 stories | 12/98 | 550 | .. | .. |
| Easton. R. & H. Simon. (Paterson, N. J.) New mill 205 by 54, 2 stories. Silk ribbons | 1/99 | 250 | .. | .. |
| Lock Haven. Lock Haven Silk Mill. (F. G. Yorks, member of the firm.) (Under construction.) | 4/99 | 400 | .. | .. |
| Newberry. Wm. Youngman. New building 45 by 42, 1 story.... | .. | .. | .. | .. |
| Parsons. Parsons Silk Throwing Co. W. J. Hartman, manager | 11/98 | .. | .. | .. |
| Phoenixville. Johnson, Cowdin & Co. (Paterson, N. J.) Ribbons | 12/98 | 300 | .. | .. |
| Reynoldsville. American Silk Co. $150,000. Joseph W. Place, president and treasurer. Satins, armures, peau de soie and taffeta. (S) Sell direct. (N. Y. office 69 Wall St.) | 9/98 | 300 | .. | 200 |
| Scranton. Valentine Bliss Mfg. Co. Silks. New mill 100 by 150, engine and boiler houses separate. (Under construction.) | .. | 150 | .. | .. |

## SILK—Continued.

| | Date of Starting. | Number of Employees. | Spindles. | Looms. |
|---|---|---|---|---|
| PENNSYLVANIA—continued. | | | | |
| Shamokin. Shamokin Silk Mill Co. $15,000. Throwing. (Installed on 1st floor of Vega Silk Co.'s new plant.) | .. | 70 | .. | .. |
| So. Bethlehem. Duplan Silk Co. $100,000. L. Duplan, president. H. Schnakenberg, treasurer. E. J. Lipps, superintendent. Novelty silks | .. | .. | .. | 150 |
| Wilkesbarre. Bamford Bros. (Paterson, N. J.) Ribbons. John Roskop, general superintendent | 12/98 | 400 | .. | .. |
| Williamsport. Lycoming Silk Mills. W. D. Holmes proprietor. Building 200 by 45, 4 stories. (Under construction.) | .. | .. | .. | .. |
| RHODE ISLAND. | | | | |
| Wyoming. Hope Valley Silk Mfg. Co. (S. J. Wylie and Wm. Solomon, interested.) Silks and satins for cloak and suit trade. (Expect to add 150 looms later.) (Leased old batting mill of F. C. McCormack.) | 11/98 | .. | .. | 50 |

## MISCELLANEOUS.

| | Date of Starting. | Number of Employees. | Spindles. | Looms. |
|---|---|---|---|---|
| MICHIGAN. | | | | |
| Sheboygan. Sheboygan Flax Fibre Co. $2,000 | 5/98 | .. | .. | .. |
| MISSOURI. | | | | |
| St. Louis. American Mfg. Co. New bagging factory, between Chouteau and Hickory Sts., 4 stories. (Construction not yet begun, 11/4/98.) | .. | .. | .. | .. |
| NEW JERSEY. | | | | |
| Hohokus. Brookdale Bleachery. Edward White, Brooklyn, N. Y., interested. Purchased plant vacated by Cohankus Mfg. Co. and will operate same as a bleachery, dyeing, printing and finishing mill | .. | .. | .. | .. |
| Lodi. Boetger-Pierce Dyeworks. New mill. $100,000. Erected on site of Byrne's Print Works, burned some time ago. (Under construction.) | .. | .. | .. | .. |
| Paterson. Barbour Flax Spinning Co. New building on Prince St., 90 by 90 feet. 4 stories. (Under construction.) | .. | .. | .. | .. |
| NEW YORK. | | | | |
| Greenwich. Dunbarton Flax Spinning Co. New building, 70 by 50 feet. (Under construction.) | .. | .. | .. | .. |
| Niagara Falls. Cataract Hair Cloth Co. (branch of Canada Hair Cloth Co. of St. Catherine, Ont.). Haircloths, crinoline, seating and tailor's paddings. New factory erected 180 x 45, 3 stories. (E D) | 12/98 | .. | .. | 90 |
| PENNSYLVANIA. | | | | |
| Allentown. Lotte & Mazeres Dyeing Co. (Phila.) New building | 2/99 | .. | .. | .. |
| RHODE ISLAND. | | | | |
| Woonsocket. Pycott Mfg. Co. $1,000,000. Col. Frank Harris, manager. "Pyralin," a new process for waterproofing goods. (New building erected in connection with Hamlet Mill where company is located, 50 by 100 feet, 2 stories.) (S. D. F. & Bl.) | 3/99 | .. | .. | .. |
| VERMONT. | | | | |
| North Bennington. A. M. Stockwell Co. Linen. (In old Vermont mill property.) | .. | 50 | .. | .. |

# PROJECTED INDUSTRIES.

Under this head are enumerated such projects as are now in course of construction, or which in all probabilities soon will be but which are not sufficiently far advanced to be properly included in the list of new mills.

## COTTON.

GEORGIA.

Calhoun. Cotton spinning mill proposed. J. B. Harrell and others interested.

Carlton. Cotton mill. Joseph E. Watson interested. Communications being carried on by manufacturer who will erect a $100,000 if town raises half necessary capital.

Columbus. Columbus Mfg. Co. $100,000. Yarns. 10,000 spindles. B. F. Gordon, secretary of committee in charge. (May install weaving.)

Dawson. Baldwin, A. J. & Co. Cotton rope.

Harmony Grove. Harber, G. W. D. & W. T. $100,000. Sheeting and drills. (Work to be commenced in the spring.) Were previously interested in Harmony Grove Mills. 5,000 spindles, 200 looms.

Lithonia. Cotton spinning mill proposed. Col. M. Mitchell, of Atlanta interested.

Madison. $20,000 spinning mill. Wm. A. Broughton, head of enterprise. Others interested are H. T. Shaw, B. P. Few, R. U. Thomason, S. B. Alexander.

Thomasville. B. F. Hawkins. Mill for either knit goods or cotton rope. Proposed.

Valdosta. Cotton mill. D. C. Ashley interested.

MISSISSIPPI.

Hazelhurst. Hazelhurst Mfg. Co. New mill for manufacturing yarns and ropes. Proposed.

NORTH CAROLINA.

China Grove. J. M. & W. R. Odell and others. New spinning mill. (Under construction.)

Edenton. Edenton Cotton Mills Co. $80,000. Frank Wood, president; W. C. Privott, secretary and treasurer. Plans being drawn. 5,000 spindle yarn mill.

Gastonia. G. A. Gray interested in project to build a 7500 spindle mill.

New Berne. James M. Harrison contemplates erecting small mill for manufacture yarn and twine.

Roxboro. Cotton mill. Proposed. C. S. Winstead, Roxboro, interested in enterprise.

Weldon. Weldon Mfg. Co. $100,000. W. E. Daniel, W. T. Shaw, M. A. Smith and others on board of directors. Spinning mill.

SOUTH CAROLINA.

Bennettsville. Cotton spinning mill. Proposed. Capital $100,000. Col. S. C. McColl interested. Will probably build mill next year.

Clover. Clover Cotton Mills Co. Capital increased. Will erect a new yarn mill.

Pelzer. Pelzer Mfg. Co. Propose erecting new mill (No. 5) with capacity of 50,000 spindles, and 1,500 looms. Steam.

Pickens. Cotton mill projected by citizens.

Ware Shoals. Cotton mill. Projector, J. S. Johnson, of Spartanburg.

TEXAS.

Daingerfield. Cotton mill. J. L. Williams interested. To manufacture duck, brown domestic, etc. 3,000 spindles.

Dallas. Cotton mill. P. Sanger, one of the projectors.

Liberty. R. L. McAllister interested in proposed cotton mill.

Waco. McLennan County Cotton Mill. $150,000. Propose erecting a 5,000 spindle mill. J. B. Baker, chairman of temporary organization.

Waxahachie. Cotton mill. $100,000. S. P. Spalding interested. (Expect to commence construction in spring.)

VIRGINIA.

Danville. G. C. Baldwin, projector. Yarn mill, single and 2 ply yarns and warps. New building to be erected. (Location will probably be in Richmond Co., N. C.)

Lynchburg. Cotton mill. 25,000 spindles proposed. Wm. O'Brien, F. H. Winipree, F. L. Emery and others interested.

## WOOLEN.

NEW YORK.

Niagara Falls. Alexander Morton Carpet Co. (of Glasgow, Scotland), propose erecting plant here.

NORTH CAROLINA.

Oxford. C. J. Cooper interested in woolen mill to manufacture union woolen goods.

PENNSYLVANIA.

Albion. G. W. Wilcox (of Conn.) proposes establishing a woolen mill at this place.

Brookville. Levi Heidrick and George W. Sykes. Flannels and cassimeres. (Construction not yet begun.) (Mr. Sykes is connected with Reynoldsville Woolen Co.) To employ 60 hands at start.

Philadelphia. Thomas Henry & Sons, Trenton Ave. and Tioga St. New 2-story mill, 42 by 110, to be erected. Construction will not begin until spring, 1899.

Philadelphia. Sykes Bros. Hancock and Huntingdon Sts. To erect new mill 50 by 100, 6 stories.

TENNESSEE.

Greeneville. H. L. Milligan and others. "Proposed." Woolen mill, also knitting department, for hosiery and underwear.

## KNIT.

GEORGIA.
Belair. Belair Knitting Mill. J. E. Cunningham, agent Georgia Mutual Colony Association, interested.
Cedartown. Featherston, G. W. Proposed. Now receiving estimates on complete plant.
Monticello. Knitting mill. Hosiery and underwear. Company organized. H. V. B. Allen, president; C. D. Jordan, secretary and treasurer.
Washington. L. N. Hull. Proposed. Now receiving estimates.

NORTH CAROLINA.
Kelford. J. H. Pritchard interested in establishing knitting mill.
Lasker. Lasker Mill Co. P. T. Hicks interested. Proposed. To manufacture yarns, hosiery and underwear.
Merry Hill. Knitting mill. Proposed, with 20 to 30 knitting machines. J. H. White and associates at head of enterprise.

OHIO.
Elyria. Fay Stocking Co. $50,000. W. L. Fay, president and manager. Special line of knit goods. (D).

PENNSYLVANIA.
Hazelton. Hazelton Flax Mills. Contemplate rebuilding factory destroyed by fire and operate the same in hosiery manufacturing.
Lebanon. Knitting mill to employ 500. proposed.
Upper Black Eddy. Hero Knitting Co. Proposed.

SOUTH CAROLINA.
Newberry. Hosiery mill proposed. E. B. Wilbur interested.

## SILK.

NEW JERSEY.
Plainfield. Plainfield Silk Co. $25,000. Propose moving machinery from idle mill of P. & I. Bannigan Co. at Lake View to this place. Will employ about 300 hands if plan is carried out.

## MISCELLANEOUS.

TENNESSEE.
Knoxville. S. S. Booth. Contemplates establishing a dye house with capacity of 1000 dozen pairs hosiery per day.

# IMPORTANT ENLARGEMENTS AND IMPROVEMENTS.

**This list is not, by any means, a complete record of enlargements and improvements, for there is hardly a mill in the country but what has made some changes and improvements. The object is as far as possible to enumerate the more important and such as would have a bearing on the growth of the industry.**

## COTTON.

ALABAMA.
Cottondale. Tuscaloosa Mills. Added 2000 spindles, etc.
Talladega. Talladega Cotton Factory. Added 1664 new spindles.

ARKANSAS.
Mammoth Springs. Mammoth Springs Cotton Mill. Added 5000 spindles and 125 looms.

CALIFORNIA.
Oakland. California Cotton Mills. Capital increased from $600,000 to $800,000 for enlargements.

GEORGIA.
Augusta. Riverside Mills. New building, 140 by 96, three stories, to increase capacity of the plant.
Columbus. Eagle and Phoenix Mills. $50,000 authorized for new looms, new warehouse, addition to machine shop and picker room, machinery for picker room and general repairs to other buildings of the plant.
Griffin. Kincaid Mfg. Co. Addition, 6000 spindles, 200 looms.
High Shoals. High Shoals Mfg. Co. Addition of 3000 spindles.
La Grange. Dixie Cotton Mills. Addition 30 by 60, accommodating 5000 spindles and equipments from picker room to cone winders complete.

MAINE.
Auburn. Barker Mill. 3 story brick addition, 50 feet long. New picking machinery to be installed.
Richmond. Richmond Mills. $12,000 voted for improvements. Addition of one story and machinery equipment.
Saco. York Mfg. Co. Addition 160 fancy gingham looms in basement of mill, also changes in upper weave room.

MASSACHUSETTS.
Bondsville. Boston Duck Co. New storehouse 46 by 106 feet, 2 stories and basement and repair shop, 46 by 122 feet, 2 stories.
Fall River. Barnaby Mills. Addition 100 by 120, one story and basement.
Fitchburg. Grant Yarn Co. Addition 75 by 45 feet, 3 stories.
Lawrence. Pemberton Co. Extensive additions to increase capacity.
Thorndike. Thorndike Mfg. Co. Addition to dye house at Mill No. 2.

MASSACHUSETTS—continued.
Waltham. Boston Mfg. Co. Addition 35 by 60, 3 stories, to finishing house, for dyeing and finishing silk and satins.
Westfield. W. Warren Thread Works. Dye house 65 by 40, 2 stories, daily capacity 4000 lbs. Installed 150 h. p. boiler, 6 automatic dressers and 12 tubing machines.
West Warren. Warren Cotton Mills. Extensive repairs and improvements including new dye house 40 by 100 feet.

MISSISSIPPI.
Stonewall. Stonewall Cotton Mills. Propose adding 5000 spindles.

NEW HAMPSHIRE.
Nashua. Jackson Co. New mill erected in place of old one.
Newmarket. Newmarket Mfg. Co. Added 10,000 spindles.
Somersworth Great Falls Mfg. Co. Added 100 Northrop looms, also other repairs and additions.

NEW YORK.
Valatie. Hall & Clark Mfg. Co. Addition. Installed 36 new cards, employing 20 more hands.

NORTH CAROLINA.
Burlington. Aurora Cotton Mills. Added 7000 spindles and 150 looms.
Durham. Durham Cotton Mfg. Co. Addition 5400 spindles and 160 looms.
Fayetteville. Holt-Williamson Mfg. Co. Operating plant of Phoenix Mfg. Co., which they purchased, added 3000 spindles and other machinery.
Franklinton. Sterling Cotton Mills. Addition 4160 spindles and other machinery.
Goldsboro. Wayne Cotton Mills. Addition for slashers and warpers, also new power machinery.
Huntersville. Anchor Cotton Mills. Addition new building also 2500 spindles and 100 looms.
Mt. Pleasant. Kindley Cotton Mills. Additional building in order to double spindle capacity.
Raleigh. Willard Mfg. Co. Removed plant to Raleigh from Willardville. $6000 expended for improvements, including 25 knitting machines for full and half hose.
Randleman. Engleworth Mills. Addition built to accommodate 80 looms.
Rutherfordton. Levi Cotton Mills. Rutherfordton Cotton Mills bought by Myer Levi and associates. Equipped with 6000 spindles. Commenced operations January 1st, '99.
Statesville. Statesville Cotton Mills. $15,000 to be expended in new machinery, to include 2500 spindles and looms.
Taylorsville. J. H. Moore. Addition. Capacity doubled, making total of 1664 spindles and 50 looms.

PENNSYLVANIA.
Philadelphia. Edwin Holden & Co., Frankford. Addition, 50 by 140, 2 stories. Special machinery installed for manufacturing damasks.
Trainer. D. Trainer & Sons Mfg. Co. Added 50 looms in Mill 2.

RHODE ISLAND.
Albion. Albion Co. Added 33 cards and 80 new looms.
Olneyville. Joslin Himalaya Co. Purchased merino mill. Replaced looms with braiding machines.
Woonsocket. Eagle Mills. Addition, 2 stories. New machinery installed.

SOUTH CAROLINA.
Abbeville. Abbeville Cotton Mills. Added 32 looms. Capital increased to provide for installation of 350 more and other machinery.
Chester. Eureka Cotton Mills (formerly Catawba Mills.) Added 5000 spindles, two 200 h. p. boilers and other machinery.
Columbia. Granby Cotton Mills. Addition. Equipment increased from 18,000 to 50,000 spindles, and 500 looms to 1000.
Cowpens. Cowpens Mfg. Co. Added 18 cards and 3000 spindles.
Edgefield. Edgefield Mfg. Co. Propose adding 2500 spindles.
Lancaster. Eureka Cotton Mills. Added 5000 new spindles and 13 new cards.
Laurens. Laurens Cotton Mills. Placed dobby heads on looms for fancy weaves.
Marion. Ashby Cotton Mills. Addition. Installed 600 spindles, also slubbers, speeders, reels and warpers.
McColl. McColl Mfg. Co. Addition 5000 spindles.
Pelham. Pelham Mills. Added 1000 new spindles.
Reedy River Factory. Reedy River Mfg. Co. To expend about $30,000 in new machinery to replace some that is out of date.
Rock Hill. Highland Park Gingham Mills Co. (Charlotte, N. C.) Purchased Standard Cotton Mills. Added spinning equipment of 10,000 spindles.
Spartanburg. Beaumont Mfg. Co. Addition 2 new buildings, one for dyeing and other for finishing. New machinery to be installed.
Union. Union Cotton Mills. Added 31,000 spindles and 866 looms.
Winnsboro. Fairfield Cotton Mills. Added 2500 spindles.

WISCONSIN.
Baraboo. Geo. McArthur & Son. Addition. Installed 20 looms.

## WOOLEN.

ALABAMA.
Pruitton. Pruitt, Thos. D. Added one set woolen cards.

CALIFORNIA.
Napa. Napa Woolen Mill. Added one set.

CONNECTICUT.
Mystic. Mystic Mfg. Co. Added 20 new looms.
Stafford Springs. Rawitzer & Bro. New spinning machinery, also new dye house.
Unionville. J. Broadbent & Son. Feb. '98 installed new set of carding machines.

GEORGIA.
Rossville. Park Woolen Mills. Additional machinery in the finishing department.

KENTUCKY.
Mayfield. Mayfield Woolen Mills. Addition built. Added 2 sets cards, 26 broad and 30 narrow looms, and 1292 spindles.
Mayville. Mayville Woolen Mills. Built addition 65 by 50 feet, 2 stories.

MAINE.
Bridgton. Pondicherry Mills Co. Addition to dye house at Mill No. 1.
Dexter. Amos Abbott & Co. Building, 56 by 104, 3 stories, 2 sets cards, 16 looms.
East Madison. Lakeside Worsted Mill. Finishing room has been added.
East Wilton. Walker Mills. New weaving shed erected. Added one set 48-in. cards and 250 spindle mules.

MAINE—continued.

No. Monmouth. Annebescook Mills. Addition to double capacity. 3 sets 48-in. cards, 24 looms.

Winthrop. Winthrop Mill Co. Addition built, containing new picker rooms and elevator.

MASSACHUSETTS.

Blackstone. Blackstone Woolen Mills, Chas. Fletcher. Addition 100 by 50, 3 stories. Piece dyed fabrics. 150 looms added.

Byfield. Byfield Woolen Co. New building, 50 by 100 feet, 4 stories. Adding 5 sets blanket cards, 21 felt cards, 35 looms and necessary spinning and finishing machinery. Finishing of blankets and felts will be done in the old plant.

Clinton. Clinton Worsted Co., Water St. New mill 50 by 110 feet. All machinery removed from lower mill to new plant. Added 2 sets cards.

East Brookfield. E. G. Gibson. Purchased building formerly occupied by R. P. Grant. Built new boiler and engine room and dye house. Put in an extracting plant. Started June, '98, employing 10 men.

Enfield. Swift River Co. Added 22 new looms.

Fitchburg. Fitchburg Worsted Co. Addition 110 by 32 feet, 2 stories.

Methuen. J. A. Jowett, Methuen Yarn Mill. Purchased plant which he formerly leased from Wendell Bros., and made additions to both building and machinery.

No. Billerica. Talbot Woolen Mills. Addition, 4 stories, also new dye house and boiler house.

Otter River. River Mills. New dye house.

Rochdale. J. D. Clark Co. Added new picker, napper and feeds.

Saxonville. Saxonville Mills. Added 5 new looms.

NEW HAMPSHIRE.

Enfield. Baltic Mills. New dye house erected and new finishing machinery installed.

Hinsdale. Chas. J. Amidon & Sons. Addition to mill 15 by 30.

Tilton. Elm Woolen Mills Co. Large addition to one of the mills. New machinery added.

NEW JERSEY.

Camden. Fries-Breslin Co. New dye house 50 by 130 feet and other additions to machinery. Capacity increased 25 per cent.

Camden. Highland Worsted Mills, 9th and State Sts. Addition 30 by 60, also new machinery.

Passaic. Botany Worsted Mill. New dye house, 100 by 194 feet and annex to main building 100 by 94 feet.

NEW YORK.

Jamestown. Jamestown Worsted Mills. Addition. 200 new looms installed.

Jamestown. Broadhead Worsted Mills. New building, 50 by 150, 3 stories, to be used for dyeing and finishing department.

Newburgh. Hudson River Woolen Mills. Addition. To increase spinning and beaming facilities.

OHIO.

Pandora. Amstutz, Welty & Co. Purchased machinery of Columbus Grove (O.) Woolen Mill and are operating 1 set of card and 2 looms. Will probably add more looms and knitting machines later.

OREGON.

Dallas. Pioneer Woolen Mill Co. Purchased plant of Dallas Woolen Mill and are erecting new dye house. Other improvements will be made later.

PENNSYLVANIA.

Bridgeport. Sterling Mills Co. Replaced 20 old looms by new ones.

Chester. South Chester Mfg. Co. 50 new looms installed to take place of others of old pattern and other improvements.

Clifton Heights. Thomas Kent Mfg. Co. Erecting 4-story addition.

Mount Joy. Geo. Brown's Sons. Addition new building. 56 new looms and 1 set cards installed, making total of 5 sets and 178 looms.

Philadelphia. Collins & Aikman Co. Addition 3 story building.

Philadelphia. John Culbertson & Son, 22d and Hamilton Sts. Added 128 narrow looms, purchased from assignee Joseph P. Murphy Co.

Philadelphia. James Dunlap Carpet Co. Large one-story brick addition to be built.

Philadelphia. W. & R. Ford. Removed to new plant built on Torresdale Ave.

Philadelphia. J. Hatfield & Co. Sciota Mills. Contemplate moving to Ripka Mills. Will probably increase looms from 64 to 100.

Philadelphia. Wm. Henderson. Moved to new mill corner Mascher and Oxford Sts.

Philadelphia. J. R. Keim & Co. New mill and dye house. Expect to occupy new plant Jan. 1st, '99.

Philadelphia. Jas. Pollock & Son. Added 5 new ingrain looms.

Reading. John Hendel's Sons. Addition 40 by 90.

Spartanburg. M. L. Tauber & Son. Purchased plant operated by Harvey Lamb. Added 10 new knitting machines and more broad looms.

RHODE ISLAND.

Davisville. Reynolds Mfg. Co. Added 5 broad looms.

Harrisville. Wm. Tinkham & Co. Addition 150 by 50, 2 stories.

Pascoag. Stone Worsted Mill, Samuel Mellor, proprietor. Added 2 sets spinning machinery.

Pawtucket. Lorraine Mfg. Co. New boiler house; installed 4 new boilers and engine. Adding 140 new looms.

Washington. Livingstone Woolen Mill. New dye house built.

TENNESSEE.

Sweetwater. Sweetwater Woolen Mills Co. Large additions. New buildings equipped with new machinery.

UTAH.

Hyrum City. Hyrum Woolen Mills Co. Addition. Installed one loom, 2 sets cards and 2 knitting machines.

VERMONT.

Saxton's River. Saxton's River Worsted Co. Added 10 new looms.

Springfield. W. H. H. Slack & Bro. Large addition to increase capacity.

VIRGINIA.

Kelly. M. L. Peery. Added knitting machinery.

WISCONSIN.

Janesville. Rock River Woolen Mills. Addition 30 by 60, 2 stories. Added new spinning machinery, 5 new looms and 4 cards.

## KNIT.

CONNECTICUT.
Winsted. Winsted Hosiery Co. Addition 123 by 38. 20 machines.

GEORGIA.
Barnesville. Hanson-Crawley Co. New building, 50 by 50. Underwear. 30 new knitting machines installed.
Marietta. Marietta Knitting Co. Capital increased to $25,000. Expended for additional machinery.

INDIANA.
Michigan City. Lakeside Knitting Co. Addition built and new machinery installed.

MASSACHUSETTS.
Ware. Otis Co. Addition built to underwear finishing department.

MICHIGAN.
Colon. Lamb Knit Goods Co. New dye house, 50 by 60 feet. Also putting in 100 h. p. boiler.

NEW YORK.
Amsterdam. Blood Knitting Co. Annex. Employing 60 additional hands and making total number of knitting machines 42.
Cohoes. Kavanaugh, F. W. Co. Addition 55 by 70 feet, brick, 2 stories. Hosiery and underwear. Installed 20 new knitting machines.
Green Island. Oliver & Roff, proprietors, Green Island Knitting Mills. Building addition to mill. Will install latest improved machinery.
Kinderhook. Linderwald Mills, C. F. Hoag, proprietor. Large addition. Added 8 knitting machines.
Little Falls. Victor Knitting Mill, Victor Adams. New addition, including dye and wash house built, 150 by 60, 5 stories.
Mechanicsville. Mechanicsville Knitting Co. Addition, 4 stories. New machinery installed.
Sidney. Clark Fabric Co. Addition to silk mill, 25 by 30, 2 stories, also addition to novelty works, 60 by 100.
Stillwater. R. & H. Newland. Installed new machinery for making fleece lined goods.
Syracuse. Clinton Knitting Co. Leased new building on Wyoming St. Increased production. Added some new knitting machines.
Utica. Kendall Knitting Co. Addition 34 by 100, 3 stories. Ladies' and children's rib goods. Capacity increased from 600 dozen per day to 1000. 150 additional hands employed.
Utica. Oneita Knitting Co. Addition 100 by 60, 4 stories. Underwear. Product doubled, giving employment to about 150 additional hands.
Utica. Utica Knitting Co. Capital stock increased from $100,000 to $200,000, for purpose of doubling plant. (At present 48 knitting machines and 8 sets cards.)
Waterford. Clyde Knitting Co. Added new machinery.

NORTH CAROLINA.
Charlotte. Gold Crown Hosiery Mills. Yarn spinning department, for manufacturing cotton hosiery yarn, on cones, 18's to 24 added to plant. 2000 new spindles and 4 knitting machines installed.
Tyron. L. N. Wilcox & Sons. Installed dyeing plant in mill.

PENNSYLVANIA.
Bethlehem. W. H. Jacobs. Hacyon Knitting Mills. Leased plant vacated by Excelsior Knitting Machine Co., and installed 60 machines on hosiery. Commenced operations March, '98, with 50 hands.
Danville. Danville Knitting Mills Co. Large addition. 100 new knitting machines installed, employing 300 more hands.
Fleetwood. Kutz Bros. New mill erected. Will remove machinery from old mill.
Hawley. U. S. Knitting Mills Co. New mill near site of one burned. (Incorporation formed to continue business of H. Nollan.)
Mohn's Store. Wyomissing Hosiery Co. Addition. Installed 25 more knitting machines.
Newville. Newville Knitting Co. Purchased paper mill and fitted up same for manufacture cotton underwear. Added 10 new body knitting machines.
Norristown. Rambo & Regar. New dye house.
Philadelphia. Querns Bros., Victoria Knitting Mills, No. 4th St. Addition 50 by 90, also fifth story to mill. Install automatic sprinklers.
Pottsville. Unger & Leininger. Addition built. Installed 7 new knitting machines making total of 13.
Reading. Reading Knitting Mills, Garnzle & Leippe. Added 160 automatic knitting machines. Capacity increased from 1200 to 1800 dozen hose per day.
Reading. S. & S. Hosiery Mills. Removed to new building. Added 40 new machines.
Spring City. Urner & Co. New dye house.
Wilkesbarre. Lee Park Knitting Mill. Morgan & Zimmermann. New dye house.

SOUTH CAROLINA.
Bamberg. Bamberg Knitting Mill. Added dyeing department.
Jonesville. Jonesville Knitting Mills. Added 20 knitting machines.

TENNESSEE.
Knoxville. Knoxville Knitting Mills Co. Added 10 knitting machines.

VERMONT.
Bennington. H. E. Bradford & Co. Replaced 4 sets of 40-in. machinery with 6 sets 48-in., other improvements.
Brattleboro. Chas. Minor. Added dyeing and washing machine and several knitting machines.
Jonesville. R. J. Robinson (branch Baker Underwear Co., Peekskill, N. Y.). Added 4 new machines.

VIRGINIA.
Portsmouth. Portsmouth Knitting Mills. Added 30 latch needle machines.

WISCONSIN.
Appleton. Appleton Knitting Co. Addition 24 by 100, 2 stories. Added 7 new knitting machines.
Sheboygan. Sheboygan Knitting Co. Added 2 sets cards and 125 knitting machines.

## SILK.

CONNECTICUT.

New London. The Brainerd & Armstrong Co. have leased Union St. School House, remodeled same and equipped building with machinery for weaving. Employees, 75.

Shelton. A. & S. Blumenthal have installed additional looms in their new plant. Employees 35; looms, 30.

MAINE.

Westbrook. Haskell Silk Co. Installed 25 looms in plant formerly operated by the Westbrook Mfg. Co. Contemplate equipping entire plant with machinery if proved successful.

MARYLAND.

Ilchester. Thistle Mills Co. Added 20 silk looms.

NEW JERSEY.

Hackensack. Givernaud Bros. Addition to mill. 200 looms installed.

Paterson. Ashley & Bailey. Addition to dye house increasing capacity from 1400 to 1600 lbs. daily.

Sterling. Sterling Silk Co. Building one story, 200 feet square to double capacity.

NEW YORK.

West New Brighton. Empire State Woven Label Co. Addition, also new looms and other machinery installed.

PENNSYLVANIA.

Catasauqua. Unicorn Silk Mills. Addition for purpose of manufacturing plush. Expect to begin operations January, '99.

Cheltonham. E. V. Pike (formerly at Phila.) Sunnyside Mills. New building 150 by 50, 2 stories. Chenille table covers. Added 6 new looms to machinery removed from Phila., making total of 38.

Danville. F. O. Hartman. Addition 20 by 53, 3 stories. Added 2000 spindles.

Ephrata. Westerhoff Bros. & Napier Addition built. 150 looms installed, making total of 226 looms.

Hallstead. Hallstead Textile Co. 3-story addition 22 by 30.

Philadelphia. Orinoka Mills. Addition, 2 stories over dye house, also 2 over engine and boiler house.

Wilkesbarre. Wyoming Valley Lace Mills. Built mill No. 2. Lace curtains. Installed 10 looms.

RHODE ISLAND.

Pawtucket. Seth Wilkinson. Added new carding, weaving, spinning, picking and dressing machinery.

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## MISCELLANEOUS.

CONNECTICUT.

Westville. Pond Lily Co. Addition, to increase dyeing capacity.

MASSACHUSETTS.

Fall River. Fall River Bleachery. Addition 65 by 200 feet.

NEW JERSEY.

Carlton Hill. Standard Bleachery. Additions to building and bleachery.

Montville. John Capstick & Sons. Addition, 135 feet square, 3 stories high, also dye house 50 by 100, 1 story.

Rockaway. Llondale Bleaching, Dyeing and Print Works. Addition of machinery, including a new printing machine.

NEW YORK.

Hudson. Hudson Fibre Co. Installed new machinery, including new dynamo.

PENNSYLVANIA.

Philadelphia. Cumberland Finishing Works, Kensington Ave. and Huntingdon St. New dye house 90 by 40, 1 story. New machinery added.

Philadelphia. Firth & Foster Co., Emerald St. Addition for finishing and storage. New machinery installed.

Philadelphia. Franklinville Dye Works, Lawrence St. Addition, 3 stories, 44 by 100, also other improvements.

Philadelphia. G. J. Littlewood & Co. Ltd., Main St. Addition 32 by 90.

RHODE ISLAND.

Cranston. Meshanticut Dye Works, James M. Bourne, manager. Remodeled and made extensive improvements in old buildings formerly used by Cranston Print Works.

Manton. James D. Minto. Dyer. Addition of new dye house.

Providence. Providence Dyeing & Bleaching Co. Addition, 4 stories.

## The Condition of the Woolen Trade in Europe During the Past Year.

*Reported by European Pattern Supply Co., New York.*

The total amount of business of the woolen trade in Europe in the year 1898 has not fulfilled its expectations, and is largely behind in figures in comparison to the years 1896 and 1897. The results of the last two named years, and especially of the year 1897, were largely due to the expected change in the American tariff. After this tariff went into effect, it was England who suffered most, inasmuch as seven-eighths of her products were barred from exportation to America. If 1897 was considered a good year for the textile industry, the year 1898 certainly showed an immense retrocession.

The enormous purchases which were made in England, and principally in Bradford and Leeds by American importers, who bought up everything obtainable that was suitable for the United States, previous to the enactment of the Dingley tariff, have not, by any means, been readily disposed of and have consequently interfered to a certain degree with the exportation from Europe of such articles which are not prohibitive under the Dingley tariff.

A direct result of the Dingley tariff on English woolens was, that quite a number of manufacturers who depended solely upon the business with America have transplanted their factories to America. The amount of business, in English fabrics, on the European continent, has been on an average with former years.

Germany, who possesses the second largest woolen industry of the continent, had exceedingly better factors to work with. If she also suffered in her exportations to the United States, her regular old markets as Germany, Sweden, Norway, Denmark, Italy, Roumania, etc., have kept her in a fair mediocrity. While other industries have shown the greatest activity, it has not been possible for the woolen trade to elevate itself, which to a certain extent has been due to the bad crop of 1897, and the unfavorable political conditions of the country which, in a measure, have affected the whole of Europe. For the same reasons, France and Italy have been handicapped, while the woolen industry of Austria, as well as most of her industries, have gained by the revival in business in the entire eastern part of Europe.

We must look with considerable attention towards Russia. The textile industry of that country is gradually growing, and it may not be very long before it will figure as a large competitor for Asiatic, and in the course of time, for European countries.

Of the principal articles which Europe manufactures in men's woolens and cloakings, it may be remarked that the largest variety is shown in men's woolens, in quality and design. It cannot be said that a pronounced preference predominates, for worsteds, cheviots and cassimeres are almost equally represented, so far as the character of the article is concerned. In finish, however, we have noticed an inclination to produce a softness on fine goods as well as on low priced fabrics. This finish, which is half velour and half melton, is being given to the articles for the coming fall season.

In designs, we find checks of all sizes and a large percentage of indistinct patterns with overplaids, which, however, are constructed sufficiently fine as not to create conspicuous effects. Worsted fabrics have been made in such cheap grades that the manufacturers of better articles use their worsted yarn, principally, in connection with other material, and are thereby making goods which are more satisfactory to the finer taste than the pure worsteds, which are put on the market in all sorts of imitations. The same can be said of pantaloonings.

In overcoatings, we see next to the old solid colors, fine mixtures in diag-

onal and boucle effects. The mauve colors, which have been leading for quite a number of years, seem to disappear, and in Spring overcoatings there is a tendency towards Oxford and Bismarck grays. We believe that covert patterns in these colors will have a great success.

The taste in cloakings has been, as in beavers and kerseys, almost exclusively for fancy plaids and for the once great article boucle. We now learn, from the best authorities, that these goods will not be used to any extent for the coming seasons, whereas fancy plaids will have a considerable run. In Spring cloakings, unicolored broadcloths have been in vogue, and covert cloths have had little sale.

## Labor Troubles in Augusta, Ga.

*Editor Textile World:*

The present labor troubles which disturb the harmony that has existed for ten years in the Augusta factory district were brought about by the action of the body known as the Southern Manufacturers' Association of Augusta. This association was composed of the presidents of the following mills: The Augusta Factory, Enterprise Manufacturing Co., Sibley Mills, Jno. P. King Mfg. Co., Isaetta, Warwick, and Sutherland Mills, of Augusta, also the Graniteville, Vaucluse, Langley and the Aiken Manufacturing Co.'s Mills, of South Carolina.

Some time early in the summer an effort was made by members of this body to bring about a general reduction of the wages of the operatives in these mills. H. H. Hickman, who was president of the association, as well as the president of the Graniteville and Vaucluse Mills, opposed the movement, and, in consequence of this and perhaps other reasons, the association disbanded. It, however, was immediately reorganized without the mills which are controlled by Mr. Hickman being represented. A resolution was passed to revise the wage schedule then being followed, so as to bring the prices for labor more on a par with those paid in other mills in the South, it being claimed that the wages paid in what is known as the Augusta district were from 10 to 20 per cent. higher than in other sections of the South.

An effort was then made to obtain the rates paid in some of the large, recently built mills in the upper part of South Carolina, Georgia and Alabama. From this, and doubtless other information, a schedule of prices was arranged which it was resolved should be paid in all the mills belonging to the association. The schedule, as arranged, did not materially change the wages of overseers, second hands, or mechanics, and the reason given for this was that this class was found to be no better paid than the same class of persons in other sections of the South.

Now, the conditions in these mills, as the machinery, for instance, differ in character. The number of yarn varies from 8 to 32. No two mills make goods of the same width, weight or texture. The machinery is just as varied as the goods made; some having plain, top flat cards, others Foss & Pevey, underflat, and some the revolving flat; and the machinery in other departments just as different. A practical manufacturer will see that under these circumstances the making of a wage schedule to fit all these different conditions, and do exact justice to all operatives, is quite a difficult undertaking.

The rates submitted reduced the wages very unequally, and as wage reductions are never popular, of course dissatisfaction was expressed. All were given two weeks' notice, and each operative was personally informed how the new rate would affect him or her.

No formal protest was made by the operatives against the reduction, and up to that time no organization existed among them.

The new rate went into effect Nov.

21, 1898, and all of the operatives were in their usual places at the hour of starting in the morning, but immediately thereafter those employed in the Isaetta, Warwick, Sibley and John P. King Mills, left their work in a body, and paraded through the streets of the city. On their arrival at the Enterprise, about 8 o'clock, some confusion among the operatives took place, and the mill was closed; but the workers in this mill did not join the strikers, and the mill was started on the second day, and has been quietly operated since, with a full force, and at the wages established by the new schedule.

The operatives at the Augusta Factory and also at the Sutherland Mills did not go out, and they are also in operation. The Langley Mills in South Carolina were affected by the strike, and are still idle, but the Aiken Manufacturing Co.'s mill, near the same place, is being operated on the reduced rates.

The operatives at all these mills, it is reported, are now organized under the labor unions. Some have left the city and have taken positions in other mills in South Carolina and Georgia. The most of these, it is believed, were not strikers, but deprived of work on account of the action of their fellow workers. The strikers are appealing for aid, and claim to have generous responses, that will enable them to hold out for a long period, but this is doubtful, and it is likely that the end of the strike is near at hand.

The Manufacturers' Association passed a resolution on the 6th instant, that if the operatives did not return to work at the reduced scale by Dec. 24th, the mills now running will be closed indefinitely, or until those idle from the strike can resume. If this is carried out it will close the Augusta Factory, the Enterprise, and the Aiken Mill.

The Warwick Mill of this city has withdrawn from the Association, and is now running. The Globe Cotton Mill has never been a member, and has not been affected by the reduction, or the strike.

AUSTIN.

Augusta, Ga.

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## An Automatic Chemical Fire Extinguisher System.

An exhibition of the working of a new automatic chemical fire extinguisher apparatus, was made recently for interested parties in Utica, N. Y., including chief of fire department, commissioners and the press representatives, which we are informed was successful to a marked degree. The sytem will undoubtedly be of much interest to textile manufacturers, and, indeed, to all property owners where the risk of water damage from the sprinklers is an important factor.

The new system has been evolved by the Utica Extinguisher Co., 46 Liberty St., Utica, and we understand that patents are pending to cover the principal features. The Utica Extinguisher Co. has for some time been making a most excellent chemical hand fire extinguisher, which has been occasionally referred to in these columns, and the present system is an evolution of that machine.

A pipe system is employed in the same manner as in the present system of automatic water sprinklers, but with very much smaller pipes. When fire occurs, the heat melts the fusible plug in the sprinkler head, an electric current is generated, passing from the head through a wire, ringing an alarm bell, and at the same time releasing a weight, which, by its connections, releases sulphuric acid into the tank chamber, generating the extinguishing gas, which is forced under pressure of 100 lbs., through the pipes to the point of discharge, where it is sprayed through an eighth of an inch discharge outlet over the blaze. It will be seen that the chemical gas, which in the hand extinguisher is generated by some personal action to release the sulphuric acid, is by this system generated in a pressure tank in

large quantities automatically by the electric current induced at the point of fire. The electric alarm is also made to serve a double purpose, not only of notifying the watchman, but it may be connected with the alarm bell in the fire station, and with the proprietor's sleeping room. We are informed that the fluid, or chemical solution, can at any time be shut off when its work has been accomplished. It is also claimed that it practically does little or no damage even to delicate fabrics or machinery.

The exhibition referred to was carried on in a small frame structure erected for the purpose, 10 feet high by 13 feet square, provided with an outlet at the top, which served to form a draught and allow the smoke to escape. Into this building a sprinkler pipe was run from the main shop, where was located the tank containing the chemical solution. On the floor were spread two bags of carpenter's shavings, and along the sides of the room was placed a large quantity of kindling wood. Over this inflammable stuff was spread two gallons of pitch tar and a gallon and a half of kerosene. We are informed that in 15 seconds from the time that the blaze was started, the apparatus had performed its work and the fire was declared out by the chief of the department.

The system will doubtless arouse much interest in insurance and manufacturing circles.

### Filters in Textile Mills.

All textile mills should know the importance of pure water for successful manufacture. Especially does this apply to mills where dyeing, bleaching or finishing is carried on, where water is used to a greater or less extent. In some respects, no mill can afford to be without some method of filtration, for economy of manufacture, if nothing more. No bright and satisfactory coloring or bleaching can be expected where impurities exist in the water that is used.

Some very interesting information on this subject is to be obtained in a pamphlet entitled "The Textile Mill, the Dye-house, and the Bleachery, from the Financial Standpoint," which can be obtained free, upon application to the New York Filter Manufacturing Company, 26 Cortlandt St., New York.

This book is published under the auspices of this company, who are well able to judge of its merits, from their long experience in this line of business, of furnishing filters, which are well known to many of our readers, one of whom, D. H. McDowell & Co., manufacturers of fine knit underwear, Cohoes, N. Y., write, in relation to an eight-foot sectional washing filter, furnished by this company, and which has been in use for the last seven years, that "during all that time it has given complete satisfaction, in converting the yellowest of the Mohawk River supply into clear, pure water, not only for boiler use, but for the washing of 300 dozen garments, largely white, per day." This is an important testimony, showing the value of a properly constructed filter for a textile mill.

### Device for Looping Machines.

Among the recently patented devices for looping machinery is one controlled by the Beattie Machine Works, of Cohoes, N. Y., builders of the well known Beattie loopers. This improvement is a tension so constructed that it vibrates, allowing the thread to be drawn in the stitch, thus giving stretching qualities to a seam, without breaking the thread. Garments looped on this machine have as much elasticity as those looped on a double stitch looper. This tension is so simple in construction that it can be applied to loopers of all makes at a small cost, without alteration of machine. The advantage of having more speed, etc., will be readily appreciated. Quite a number have been installed in the different underwear and hosiery mills, and wherever they have been intro-

duced they have met with a marked success. Any other information regarding this new tension will be cheerfully given by the makers, Beattie Machine Works, Cohoes, N. Y. This firm reports a good business, as they are selling many loopers, both single and double stitches.

## Some Causes of Defects in Textiles.

Abstract of a lecture delivered at the Technical Schools, Shipley, England, by Albert M. Chapman.

The actual production of the finished cloth from the greasy wool is dependent upon so many different persons and processes that there must always exist a certain liability to error and imperfect goods; good management and close observation may reduce the chance to a very small one, but it still exists, and we find that even in the best managed places imperfect goods occasionally turn up and cause trouble and loss to all concerned. When a piece of cloth has been dyed and finished it is often found to be a very difficult matter to locate the cause of the defects and place the responsibility upon the proper shoulders. The manufacturer may think the fault is not his, but the dyer and finisher, or possibly the spinner, and vice-versa.

It may be urged that it is not within the province of everyone to have the opportunity of gaining the all-round knowledge necessary. This is only partly true. It must be admitted that experience teaches one a great deal in regard to these defects, but experience often proves very expensive, and causes one to wish that the knowledge had been gained by some other means, and the trouble to have been anticipated and prevented. Technical Schools, among many useful offices, place within the reach of everyone the opportunity to gain a knowledge of all the processes of manufacture from the wool to the finished fabric, which is of very great help in enabling one to understand how certain defects come about in dealing with either the wool, yarn, or cloth, and well repays the time spent in studying them, giving a much wider knowledge than if narrowed down to one particular branch, as is often the case.

We might now proceed to ask: Where do the defects arise? and in answer I propose, for simplicity, to divide the causes into six sections as follows:

(a) In the wool;

(b) In the making of the yarn;

(c) In the preparation of the warp for the loom;

(d) In the weaving;

(e) In the dyeing and finishing;

(f) In the actual structure of the cloth.

Where a good and even thread is necessary, such as in the majority of worsted goods, the one thing of first importance is the proper selection of a good and sound character of wool. If it is tender or weak in places, it becomes simply impossible to produce a smart and even thread, and such wool should only be used for low-class goods. The cause of weakness can generally be traced to the sheep; it may be bad breeding, lack of proper food, sickness, or sudden chills, which check the growth or nourishment which is necessary for its proper growth. A further defect which causes part trouble are fibres known as "kemps," or dead hairs, which are deficient in regard to the cellular structure possessed by ordinary wool, rendering them very difficult to deal with in the various processes. They are strong, bright fibres which do not unite readily with the other fibres in forming the spun thread, but are always of a stiff nature, appearing largely on the surface, and simply held in position by the other fibres. Further, by reason of their deficiency in regard to cellular formation, they have practically no powers of absorption, which renders them difficult to dye. Instead of the agents penetrating into the fibre, they just tint the outside, giving anything but a pleasing effect if they are present in a fairly large quantity. They are chiefly found in the fleeces of the

large quantities automatically by the electric current induced at the point of fire. The electric alarm is also made to serve a double purpose, not only of notifying the watchman, but it may be connected with the alarm bell in the fire station, and with the proprietor's sleeping room. We are informed that the fluid, or chemical solution, can at any time be shut off when its work has been accomplished. It is also claimed that it practically does little or no damage even to delicate fabrics or machinery.

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## Some Causes of Defects in Textiles.

Abstract of a lecture delivered at the Technical Schools, Shipley, England, by Albert M. Chapman.

The actual production of the finished cloth from the greasy wool is dependent upon so many different persons and processes that there must always exist a certain liability to error and imperfect goods; good management and close observation may reduce the chance to a very small one, but it still exists, and we find that even in the best managed places imperfect goods occasionally turn up and cause trouble and loss to all concerned. When a piece of cloth has been dyed and finished it is often found to be a very difficult matter to locate the cause of the defects and place the responsibility upon the proper shoulders. The manufacturer may think the fault is not his, but the dyer and finisher, or possibly the spinner, and vice-versa.

It may be urged that it is not within the province of everyone to have the opportunity of gaining the all-round knowledge necessary. This is only partly true. It must be admitted that experience teaches one a great deal in regard to these defects, but experience often proves very expensive, and causes one to wish that the knowledge had been gained by some other means, and the trouble to have been anticipated and prevented. Technical Schools, among many useful offices, place within the reach of everyone the opportunity to gain a knowledge of all the processes of manufacture from the wool to the finished fabric, which is of very great help in enabling one to understand how certain defects come about in dealing with either the wool, yarn, or cloth, and well repays the time spent in studying them, giving a much wider knowledge than if narrowed down to one particular branch, as is often the case.

We might now proceed to ask: Where do the defects arise? and in answer I propose, for simplicity, to divide the causes into six sections as follows:

(a) In the wool;

(b) In the making of the yarn;

(c) In the preparation of the warp for the loom;

(d) In the weaving;

(e) In the dyeing and finishing;

(f) In the actual structure of the cloth.

Where a good and even thread is necessary, such as in the majority of worsted goods, the one thing of first importance is the proper selection of a good and sound character of wool. If it is tender or weak in places, it becomes simply impossible to produce a smart and even thread, and such wool should only be used for low-class goods. The cause of weakness can generally be traced to the sheep; it may be bad breeding, lack of proper food, sickness, or sudden chills, which check the growth or nourishment which is necessary for its proper growth. A further defect which causes part trouble are fibres known as "kemps," or dead hairs, which are deficient in regard to the cellular structure possessed by ordinary wool, rendering them very difficult to deal with in the various processes. They are strong, bright fibres which do not unite readily with the other fibres in forming the spun thread, but are always of a stiff nature, appearing largely on the surface, and simply held in position by the other fibres. Further, by reason of their deficiency in regard to cellular formation, they have practically no powers of absorption, which renders them difficult to dye. Instead of the agents penetrating into the fibre, they just tint the outside, giving anything but a pleasing effect if they are present in a fairly large quantity. They are chiefly found in the fleeces of the

lower or wilder classes of sheep, and sometimes amongst the more cultivated ones, but by care in choice of sheep for breeding, as well as in rearing, the fault can be to a large extent stamped out.

A matter where very often insufficient care is shown in dealing with the wool is in the washing. What is required is to remove all the impurities, dirt, grease, etc., in as gentle a manner as possible so as to retain to the full all the natural properties the wool may possess. To do this, the following things are absolutely necessary. Soft water, soap which is not strongly alkaline (i. e., as near neutral as is expedient for the proper cleansing of the wool), and liquor of not too high a temperature.

We must now see where the bad effects come in when these points are not watched. We find that water will generally contain a certain quantity of mineral matter, which, if present in a large quantity causes it to be hard, the degree of hardness depending upon the quantity of mineral matter present, which must be precipitated before the water can be used with safety for cleansing the wool. Lime is often present in some degree, and must always be got rid of before adding any soap; if not, the lime decomposes the soap, a portion of which unites with the lime and forms a nasty sticky matter, or lime soap, which is not of the slightest use for scouring, but damaging to the wool. This sticky matter settles on the fibre, and is never satisfactorily got rid of afterwards, causing trouble when the piece comes to be dyed, as it is almost impossible to scour it clean, and the dye consequently does not settle on the fibres all over alike, giving shady and flecked pieces. It sometimes happens that the same mistake is made by scouring the woven piece with water containing a quantity of lime, which produces exactly the same results. To precipitate these mineral substances various methods are employed, but probably the most simple is by the additon of Carbonate of Soda or Potash, the quantity to be added being altogether dependent upon the quantity of mineral matter present. For a fair good water, 2 lbs. per 1000 gallons would suffice, but a very hard lime water would probably require 6 to 8 lbs. per 1000 gallons.

On examining the wool fibre under the microscope we find it shows on the surface a series of scales or serrations overlapping each other like a fir cone; the greater the quantity of them, the better the quality of wool is in regard to its spinning and felting properties. The finest Merino wools, which possess the largest number of these serrations, spin to the highest counts and produce the very finest and best qualities of cloth. From this, I think, it must be very evident these serrations are of special value, and should not be injured in any way. We find, however, that sometimes by using strongly alkaline soaps and water at a high temperature, these scales are partly dissolved, and their useful properties to a large extent destroyed, rendering the wool somewhat harsh and of a yellow color instead of being soft, silky, and white. Soaps having a soda base are often used for washing exceedingly dirty wool, because they cleanse it quicker than potash soaps; but the latter will always treat the wool kinder, and though taking longer to do the work, give a better result in the form of a nice handle and good color. Soda soaps, especially when the alkali is much in excess, are exceedingly dangerous. Attention to these points can make all the difference in the quality of the finished fabric, and from the same class of wool, by harsh treatment in the washing, a much inferior article may be produced.

The blending of the wool next claims our attention, and my observations for the present will apply chiefly to woolens. For woolen goods more liberty is generally taken in blending various materials (especially in the lower-class trade) than in worsteds, because the effect to be produced is of quite an opposite nature. In the

worsted fabric the thread structure is distinctly visible, and so evenness is of great importance, while in woolens it is to a large extent hid by milling or felting; but still great care is necessary in regard to the selection of the materials to form the blend, or very unsatisfactory results are produced. If the contrast in quality and length is great, it becomes all the more important they should be thoroughly mixed, because there is always a tendency on the part of the long and short to keep separate; further, if the qualities are much apart the dye will act on each rather differently, producing probably one rather darker or duller than the other, and unless the fibres are thoroughly well distributed will result in uneven and cloudy pieces. Where an even and smart cloth is required, wools which are much different in their characteristics should not be mixed together for piece dyeing, but in the lower types of fabrics, where a fair amount of strong fibre is raised on the face, then rather more liberty may be taken.

The method adopted in blending fibres for woolens is of quite a different character to that in existence for worsteds. Briefly, it consists in the first place of building up a stack or bed of wool composed of layers of the various materials placed one above the other. A layer of one quality, a few inches thick, is laid on the floor and oiled; next a layer of another quality is laid on the top and oiled, this process being repeated until the stack is built; the thickness of the layers is dependent upon the relative quantities of the various materials. The mixing is done by feeding it into the "Teazer," which roughly mixes up and disentangles the fibres, and afterwards into the "Fearnought," which gives it a better mixing and further disentangles the fibres. One of the most important points is to see the feeding is done by drawing the wool out of the stack from top to bottom, and thereby ensure that something like a proportionate quantity of each material shall always be going into the machines, and further to see the blend is put through the machines a sufficient number of times to give it a thorough mixing; if not, it results in shady or cloudy pieces. I shall just here give two examples to illustrate these points: (1) A number of pieces of piece dyed woolen coatings were made from a blend of two qualities of materials, one of which was a trifle brighter and harder than the other, and did not possess the same shrinking properties. Nothing was noticed wrong until the pieces were being milled, when the defect appeared in a cloudiness and unevenness distinctly showing small patches of the two materials, and by reason of one shrinking a trifle less than the other gave the piece a slightly cockled appearance. The cause was carelessness in the feeding, by drawing away from the top instead of the side of the stack, and insufficient mixing. (2) A quantity of Vicuna mixture coatings were made from a fine soft quality of lambs' wool, all of one quality, but various shades forming the mixture. In the unfinished state the trouble was not suspected; certain places looked darker than others, but were only looked upon as bobbins of slightly soiled weft, which would scour up clean. When scoured, however, the bars were still there, showing across the width of the piece. The line was not of an exactly definite character (as would be the case with a bobbin of a wrong shade of weft), but irregular, with the color showing in a trifle larger patches than the other parts. The shadiness could be seen also in the warp, but not so as to be objectionable, because the warp threads had been well distributed. The cause had been exactly the same as the previous example; i. e., bad feeding and mixing.

(To be continued.)

—That cotton or other vegetable fibre becomes glossy and lustrous on mercerizing and stretching and has a greater affinity for dyes is now ancient history.

# COTTON DEPARTMENT.

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## American Cotton Spinning Machinery.

ARTICLE VII.

*CHARLES CLIFTON HEDRICK.*

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After the cotton has passed through the opening and cleaning process, there still remains a considerable amount of leaf, sand, particles of seed and small clusters of unripe fibres, which must be removed before it can be spun, properly, into yarn. If we carefully examine a lap, from the finisher picker, we will see that, in addition to these impurities, the fibres lie in different directions, in small tangled tufts, or bunches, of unequal thickness and density, and it is necessary to card or comb them to disentangle, straighten and clean them.

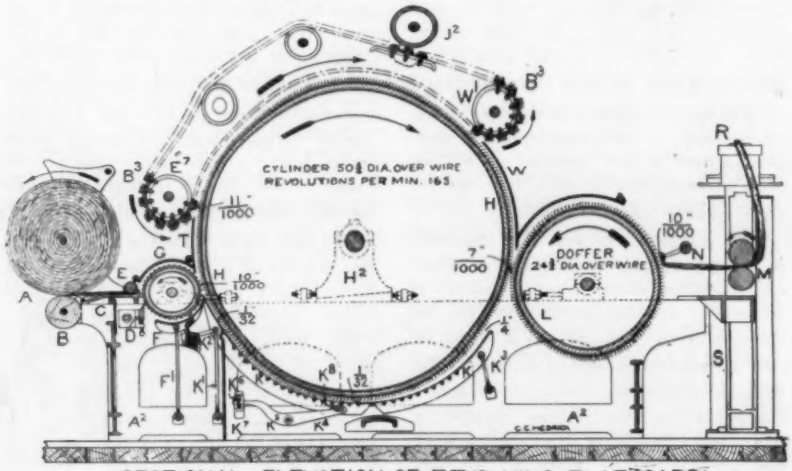
The cotton card, like all other machines used in cotton spinning, has grown from a very primitive form. There are now, practically, only three styles of cards in use, the revolving flat card, the stationary flat card, and the roller and clearer card. Of these, the revolving flat card is at present receiving the most attention from manufacturers, and where it is necessary to replace old and worthless ones, or when equipping a new mill, this style is nearly always used.

The next style referred to, the stationary flat, or Wellman card, was used almost wholly until the revolving flat card was introduced, and many of the older mills are fitted with them. If properly clothed, ground and set, they will produce work equal to any kind of card, but, as the carding surface is small, of course the production is proportionately less than on the revolving flat card.

The roller and clearer card is used principally for carding waste and cotton intended for coarse numbers of yarn, where quality is not the first consideration.

A sectional elevation of the revolving flat card is shown in Figure 36.

The lap A, from the finisher pick-




SECTIONAL ELEVATION OF REVOLVING FLAT CARD.

FIG. 36.

er, which is placed in the lap stands, rests upon the lap roll B, by which it is slowly revolved, the surface speed of the lap roll being just sufficient to unwind the lap at the same speed that it is received by the feed roll. The sheet of cotton then passes forward on the feed plate C, and under the feed roll E. As the fibres pass up, over the curved part, or nose of the feed plate, they come in con-

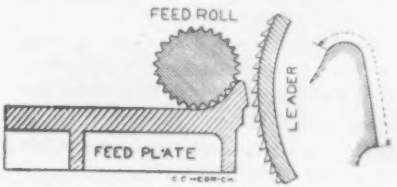



FIG. 37.

tact with the teeth of the leader, or licker-in, G, which is about 9½ inches in diameter and is covered with steel teeth, inserted in its surface, which resemble the teeth of a saw. The action of the leader is two-fold, that of removing the dirt, and that of combing or straightening the fibres. When the teeth of the leader (the surface speed of which is about 1050 feet per minute) strike the fibres, the force of the blow strikes down and partially removes the dirt. The fibres, which have then advanced far enough beyond the bite of the feed roll, are removed and carried around by the leader, while those which are held by the feed roll are combed and straightened. The fibres thus receive a very effectual cleaning, more dirt being removed at this point than in any part of the card.

Upon being carried around by the leader, the fibres are drawn over the top edge of the mote knife D. This knife also aids in removing the dirt, etc.

Directly under the leader is a screen, or grid, F, called the leader screen. The part of the screen, with which the fibres first come in contact, consists of a series of bars, running across from side to side of the card; the rest of the screen, from the last bar to a point, where it is hinged to the cylinder screen, is perforated with small holes. The object of this screen is to prevent the cotton from leaving the leader and to allow the foreign substances, which, being heavier, are thrown out by centrifugal force, to drop through these perforations.

The fibres, which have been brought around by the leader, are now taken up by the cylinder, H, the surface velocity of which is a little more than twice that of the leader. The wire teeth, or card clothing, of the cylinder, are much finer than those of the leader, and, as both surfaces run in the same direction, the fibres are very readily stripped from the teeth of the leader and carried forward under the flats $B^3$ to the doffer L. The flats, which are faced with card clothing, similar to that of the cylinder, embrace a little more than one-third of its circumference and travel slowly in the same direction as the cylinder. As the fibres are carried beneath each successive flat, they become more thor-

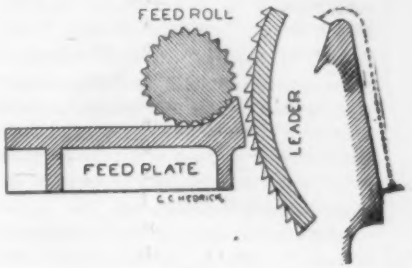



FIG. 38.

oughly cleaned and straightened. The speed of the cylinder plays an important part in this operation. If the fibres are short, they will be removed by the flats; but if they are sufficiently long, they will hold to the cylinder and be combed by them. The fibres are now transferred from the cylinder to the doffer. Just how this is done may seem perplexing to many, but if we stop to consider a moment, it will

be found very simple. Although the surfaces of the cylinder and doffer run in the same direction, the clothing of each is bent at a different angle, the doffer clothing presenting a series of hooks upon which the fibres are caught and withdrawn from the cylinder. If we closely examine the cylinder, it will be seen that many of the fibres stand out from its surface, not in straight lines, parallel with its circumference, but in a loosely tangled mass, which is effected partially by centrifugal force, but more by the natural irregular disposition of the cotton, and, as most of the fibres are carried around by the cylinder a great many times, before they are transferred to the doffer, their repeated passing beneath the flats changes their position which finally results in their withdrawal from the cylinder. Then too, the fibres cross and recross each other so the withdrawal of one or more easily affects others.

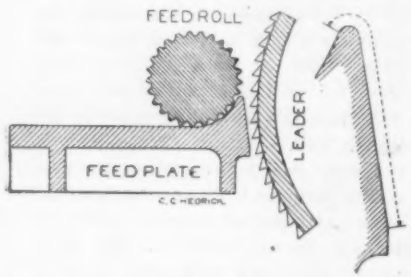



FIG. 39.

Beneath the cylinder is the cylinder screen K, which extends from the leader screen almost to the doffer, and which is made in two parts, hinged in about the centre. Each half, for the greater part of the length, consists of a series of bars, running from side to side. If no screen is used under the cylinder, its high surface velocity (about 2150 feet per minute), would cause the fibres to stand out and finally become detached, but with a screen, this cannot happen, while the heavier impurities, which are thrown out by centrifugal force, fall between the bars.

The doffer, which is 24¾ inches in diameter outside of the wire clothing, runs at a very slow speed, not over twenty revolutions per minute, at the most. The fibres are consequently deposited on its surface in a more condensed form than on the cylinder, and they are carried around and combed off by the doffer comb N, which draws them from the points of the teeth, and, as they lie very loosely upon the surface of the doffer, they are easily detached.

The fleece, or web, is now passed between the calender rolls M, by which it is condensed into a soft, rope-like mass called sliver. From here it is drawn upwards and enters the coiler R, where it is coiled very compactly into the can S.

The operation of carding having been considered, in general, the details of the card will now be described, starting with the feed plate.

Figures 37, 38, 39 and 40 show sections of different feed plates which provide for the various lengths of cotton, so that they may be readily combed and cleansed, without injury to the staple. Figure 37 shows a feed plate which is used for short staple and waste cotton. The distance from the bite of the feed roll to the lower edge, or point where the teeth of the leader are nearest to the face, is quite short. The next plate, Figure 38, is for medium length staple, the distance from the bite of the feed roll to the lower edge of the face of the feed plate being considerably greater than

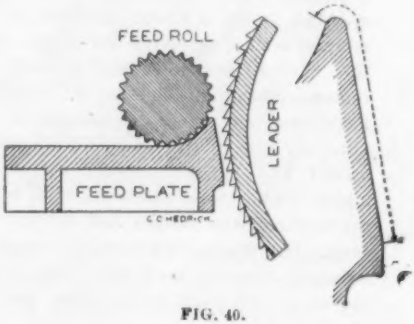



FIG. 40.

in number 37, and the nose much sharper. Figure 39 is for long staple Egyptian cotton. It will be seen that the distance from the bite of the feed roll to the lower edge of the plate is greater than in either of the others, and the nose still more pointed. The last plate, shown in Figure 40, is for Sea Island cotton. In this style, the length of the face is greater than those

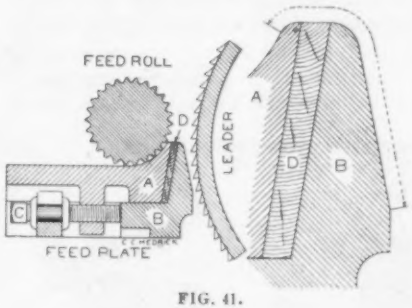



FIG. 41.

used for all the other varieties of cotton. The exact size and outline of the nose and face of the plates are shown at the right hand in all four views, the distance between the bite of the feed roll and the lower edge of the plate being indicated by dotted lines. In all cases this distance should be slightly more (from one-sixteenth to

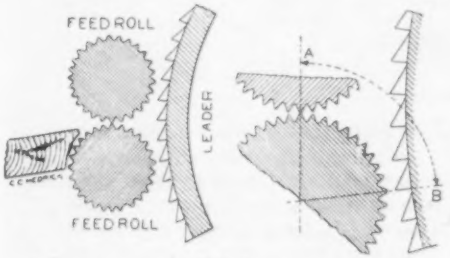



FIG. 42.

one-eighth of an inch), than the average length of staple being worked, otherwise the fibres will be broken by the leader teeth trying to take them away, before they are liberated from the bite of the feed roll. The angle of the face of the feed plate should be such as to cause the teeth of the leader to comb the fibres for about two-thirds of their length before they become detached.

In Figure 41 is shown a section of an adjustable feed plate which is intended to provide for different lengths of fibres. This plate is composed of two parts, a top piece A, which is movable and is adjusted by the screw C, and a base piece B, which is fastened to the side of the card, while strips of hard wood D, of different thicknesses are used to fill the space between the pieces. This plate possesses no merits, not giving good results when put into actual use.

Figure 42 shows the method which was used for feeding the card before the feed plate became generally adopted. It may still be found on the old style of stationary top cards. Instead of a single feed roll, two rolls were used which were about 1⅜ inches in diameter. The cotton was carried forward between them to the leader, or cylinder—some of the oldest cards having no leader. The distance from the bite of the feed rolls to the point of contact with the leader (indicated by the radial lines A and B), is about 1¼ inches, and, unless the fibres are at least 1¼ inches long, they will become detached from the bite of the rolls before they have received any combing from the teeth of the leader, the cotton would thus be delivered to the cylinder in small tufts. To overcome this, the rolls were made small in diameter, but this introduced another evil, the rolls springing apart in the centre which caused the lap to be fed very unevenly.

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—More graceful than the spinner of flax was the spinner of wool, in the days of our grandmothers, standing by the great symmetrical wheel, drawing the thread with pliant, easy motion, stepping backward and forward, as the thread was spun and run upon the spindle; in her right hand the stick, to keep the wheel rotating; always an attractive picture in colonial home interiors.

## Cotton Combing.

ARTICLE II.

The laps made on the sliver lap machine are placed behind the ribbon lap machine and are passed through four sets of drawing rollers and over curved plates onto a table. Here each sheet is calendered and then condensed and wound onto the spool the same as on the sliver lap machine.

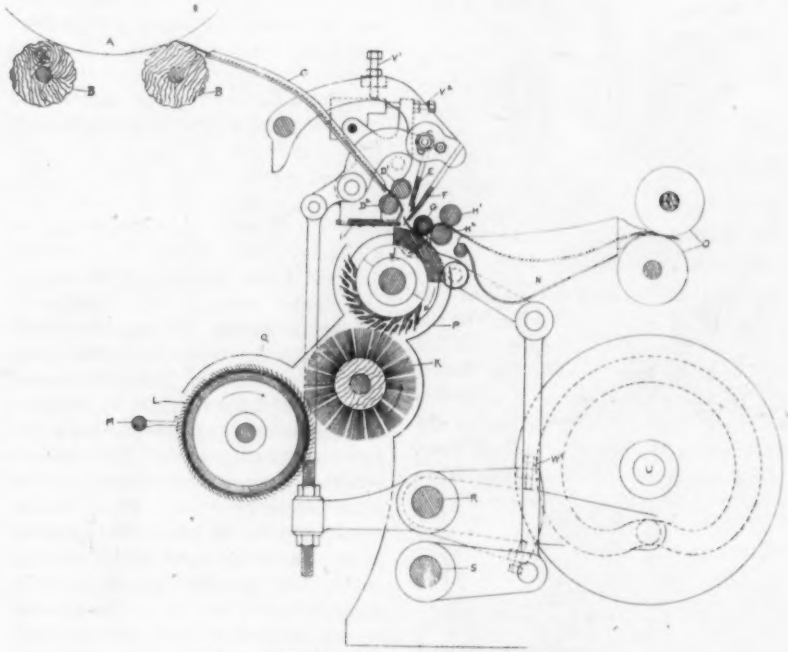


FIG. 3.—SECTION OF A SINGLE NIP COMBER.

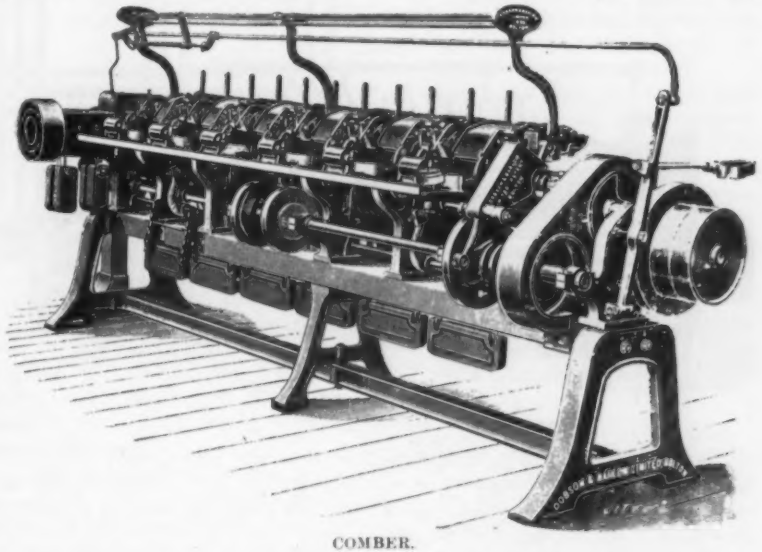
Great watchfulness on the part of the operative is required, as there are no stop motions, except on the back, and the thin sheets are either caught on the curved plates or on the small calenders, causing a large amount of "single." The curved plates should be covered with brass, and must be free from any roughness, frequent scouring and burnishing being in order. The great advantage claimed for this machine is that the sliver is presented to the comber needles in an even layer instead of a number of slivers lying side by side, which causes less damage to the needles in the comber, less waste, greater production, and more strong, even yarn. Some overseers using this machine do away with the first drawing, but it is advisable to draw it once in either case, as the condition of the sliver helps to a great extent the work of the sliver lap and ribbon lap machine.

The figuring for the ribbon lap machine is practically the same, with the exception of the draft. Here the draft is figured from the calender or condensing rollers, as a slight draft is necessary to draw the sheets from the draw box. It requires a draft of 6 or a little over, and as six laps are usually put up we have practically the same weight at the end, and the same production is obtained as on the sliver lap machine. Horse power between ¾ and 1 H. P.

The lap is placed upon the two fluted wooden rollers behind the comb, six laps being the usual number.

The sheet is passed through the feed rolls of the comber, a short length at

a time, which depends on the length of the staple, and comes between two plates, the lower called a cushion plate, and the top the nipper, which takes a firm grip on the cotton. When this is done a cylinder partially covered with needles passes through the end of the lap, combing out all the short and neppy fibres. After the cotton held by the needles is combed out, the fluted portion of the cylinder comes forward, and at the same time the cushion plate is rocked down, thus laying the combed portion on the fluted segment. At the same time a leather roller comes in contact with the segment, detaching the portion of the lap, which was held by the nipper carrying it forward. The part thus held by the nippers is brought forward, and as the top comb comes down the tail end of the cotton is combed out.



COMBER.

Just before the detaching has been done, the portion combed has to be attached to that previously combed. This is done by the detaching rolls turning back a short length covering the newly combed sheet, and again turning forward a greater length, thus laying the fibres on a thin length of sliver. The sheet is then carried forward under calender rolls down a long table and into a draw box, after which it is coiled down into a can. These operations are continued at a rapid rate, and a continuous sliver is the result.

The action of the comber can be more clearly understood by reference to Fig. 3, which shows a section of a single nip comber. The lap "A" is placed on the fluted wooden rollers "B," which unroll it and carries the sheet down the polished plate "C" to the feed rolls "$D^1$" and "$D^2$" the exact amount of feed depending on the length of the staple of cotton being used. The length fed goes between the cushion plate "I" and the nipper "E," whose action together hold the staple firmly for the needles on the cylinder which come around and pass through the portion of the lap projection from the cushion plate, freeing from it the short fibres and neps. The length held by the nippers has not been combed, and so at this point the sheet must be detached and the end combed out by the top comb "F." As the segment on cylinder "J" comes around, the leather detaching roller "G" is brought in contact with it by the action of a cam, and rotating, it detaches the portion of the lap, which

is freed by the opening of the nipper "E," and the end that is held by the nippers is combed out by the falling of the top comb, "F." The sheet of cotton thus combed out must be attached to the part previously combed, and must be done just previous to the detaching. To do this the detaching roller "H" turns back a portion of the already combed sliver, and on this the newly combed tuft is laid, and attached by the pressure of the leather detaching roller "G." "H" now moves forward a greater distance, and it can be seen that the combed fibres are always in a sheet of the same thickness. Suppose "H" moves back $^1/_2$ of a revolution, carrying the thin portion of the sheet back, and then moves forward $^2/_3$ of a revolution, it can be seen that the portion overlapped is $^1/_{12}$, and when roller is again turned back it is only the single thick $^1/_3$ that returns. The thin web of cotton is carried through the pan "N" between the calender rolls "O," down a polished table into a draw box thence into a can. The portion which is combed out is brushed off the cylinder needles by the brush "K" onto the doffer "L," and combed into waste can by comb "M."

COMBER.

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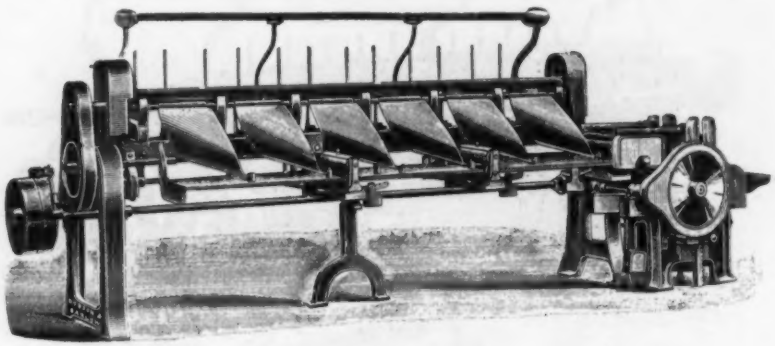
—Though commercial education in Germany is an affair of yesterday, the Empire is the home of technical education.



RIBBON LAPPER.

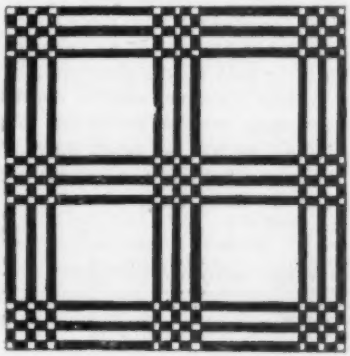
### Making Cloth from a Pattern.

If a sample of cloth has been given, and it is desired to produce other cloth as per sample, or if a sketch of the desired pattern or style of cloth is given, the first thing requisite will be to obtain the sleys and counts of yarns. Now we will suppose by way of illustration, that we have received a sketch of a check pattern composed of satin and plain, and it is desired to produce a cloth similar to such; the sketch being given as below.

Now supposing that this check has to be made square, that is, the number of ends and picks being the same in one inch of cloth. Then we will have say, 64 ends and 64 picks to the inch, which will give us 32 dents as a basis to work upon. In measuring the size of the full pattern, we find that it just equals a distance of $1^{17}/_{32}$ inches, and there being 32 dents to an inch, the total number of dents required will be $32 \times 1^{17}/_{32} = 49$. In order to obtain this number of dents for each individual stripe, each one is measured separately and the size divided into the number of dents per inch. For instance, the size of the first satin stripe is $^3/_{32}$ of an inch, and there being 32 dents to an inch, gives three dents to that stripe. The next stripe, plain, is measured, and is found to be $^1/_8$ of an inch; therefore eight divided into thirty-two equals four dents for that stripe, and so on until the pattern is

all gone through with. This will also prove whether the first calculation is right or not.

If the cloth is required to be 28½ inches wide, then the number of dents in one inch of cloth, multiplied by the inches in width, will give the number of dents across the piece. This number, divided by the number of dents in a pattern, will give the number of pat-



SKETCH.

terns in the full width of cloth. $32 \times 28\frac{1}{2} = 912$ dents. $912 \div 49 = 18$ patterns and 30 dents over. There will therefore be a plain stripe at both sides of the cloth.

In the arrangement of the picks, one inch of cloth, or 64 picks, is put in before the checking begins, then, as the ends and picks are to be square for the first filling stripe, satin, which will occupy the same distance as the first warp stripe, there will be only six picks, but, as the stripe is required to be of the same density as its corresponding warp stripe, we shall have to insert more picks and use what we may call a pick slackener, so that there will be no taking up for certain picks. To make them equal, there is required to be twelve picks, so that the slackener will have to be raised for six picks. Eight picks of plain are then put in, and the satin repeated again as before, and so on until the pattern is complete.

Now, the pattern has been made as a four harness satin, which is also called a broken twill, therefore the number of harnesses required will be eight and two added for selvages. The centre of pattern to be plain and the spots in check to be satin reversible. The draft will, of course be straight, and the pegging or chain, plain, as given at Fig. 2, which is in a condensed form, but is equally as simple, showing when they have to be repeated and how many times. The yarns that may be used are for the body of the cloth about 50's, and the satin 80's, and the filling 75's.

The question that now presents itself is that of obtaining or using the right reed that will give the number of ends to the inch that is required.

It is an established fact that a reed must be used that has a less number of ends to the inch than there are in the cloth on account of the contraction that it undergoes. This subject of contraction has been made a study of, and has been much written about, consequently there have been various rules given by which this contraction may be found, and while these rules may and will in some cases be found correct, yet the safest and surest method

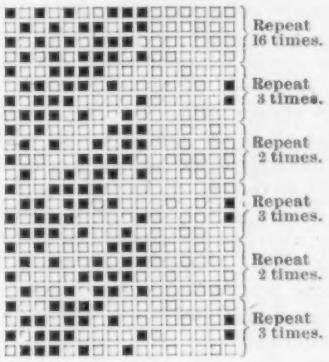



Fig. 2.

is that of experience, on account of the difference in yarns, which, when once got, will prove of valuable aid at arriving at a conclusion with regard to others to be made. In this case about 30's reed would give the correct amount of shrinkage. If it had been required that the satin give a rounder

and fuller effect, then we could have used either a five or six harness satin. If either of these had been used, say the six harness, then to obtain the same effect in the filling stripe we should have to use six harnesses for the plain, and also increase the number of picks.

### The Round Bale as a Compressed Bale.

The American Cotton Company are having some trouble with the railways in the South Atlantic States, in inducing them to receive their bale subject to freight rates equivalent to those given to the ordinary square compressed bale. We particularly allude to the recent action of the railways in South Carolina, which have refused to take the round bale at the same rate as that given to the ordinary shaped bale.

The contention of the company before the South Carolina Railway Commission, before which the question has been taken, is looked upon as a most reasonable one, on the ground that there is no good excuse for refusing the company the same rates as are charged on ordinary compressed cotton, or, in other words, to allow them the charge for compressing, the same as is allowed for reducing the size of the square bale. We are informed that all of the railroads west of the Mississippi River, and quite a number east, in fact, all of the railroads in the United States, except those comprising what is known as the South-Eastern Traffic Association, recognize the round bale of this company as a compressed bale, and charge freight rates accordingly. In some instances, the railroads and the steamships are said to give the company a less rate than they charge on the compressed square bale. It appears reasonable that some concession in rates should be made, when it is considered that the round bale is compressed to a density of 35 pounds to the cubic foot, while the square bale is compressed to a density of only 22 to 23 pounds to the cubic foot. It might be expected, however, that there would be considerable opposition from established interests, to the new method of baling, and the only roads, seemingly, that are antagonizing the bale in this respect, comprise the South-Eastern Traffic Association.

### Cotton Mills' Dividends.

The rates of dividend paid by several of the leading New England cotton mills, in December, as compared with those paid by the same concerns six months previous, show a decided improvement in the status of their business. As will be noted, only one mill shows a reduction in its rate, and that is the Great Falls.

| Mills. | June, 1898. | Dec., 1898. |
|---|---|---|
| Amory | 3 | 3 |
| Great Falls | 5 | 4 |
| Jackson | 2 | 4 |
| Lancaster | 3 | 4 |
| Lawrence | 3 | 3 |
| Massachusetts, in Georgia | 3 | 3 |
| Nashua | 4 | 4 |
| Pacific | 5 | 5 |
| Stark | 3 | 3 |
| Wamsutta | 1½ | 1½ |
| York | 0 | 2 |

—The many processes of raising and preparing the wool are full of interest. The breeding and care of sheep to produce the best wool was carefully studied by colonial farmers, as so much depended on their exertions in this branch of industry. Sheep shearing was one of the events of the year, the spring time gathering for work and feast, as the husking bee was the autumn frolic. Neighbors gathered from a distance of several miles to help in the shearing, and the peaceful serenity of pastoral scenes, the sheep grazing in sunny meadows, by running brooks and placid ponds, was quickly changed into stirring activity, caused by the catching and washing of the struggling sheep and lambs, and holding them for the shearer, which was no easy or agreeable task.

—Many benzidine dyestuffs are used for obtaining light-colored grounds on cotton.

# WOOLEN DEPARTMENT.

## Possibilities of Pattern Making by Drafting.

*THOS. R. ASHENHURST.*

It is a recognized maxim amongst lecturers, teachers and public speakers generally, that you cannot presume too much upon the ignorance of your audience, at least on the subject with which you are dealing.

At the outset I am going to presume very much for the purpose of being able to lay a solid foundation for some of the most important methods and principles in pattern making. I am merely making use of the term drafting as a matter of convenience, and for the purpose of showing that drafting is possible only when some of the threads composing the pattern are working identically with each other, but are arranged in different orders in relation to each other. Take for example a common four-thread twill where the warp and weft each pass under and over two. Every thread in the pattern is doing identically the same thing all the time, but not at the same moment. They are following each other in regular succession, but every fourth thread is doing the same thing at the same time, and consequently may be operated by the same heald shaft. Hence no matter how many warp threads there may be in the aggregate, the whole of them, can be operated by four heald shafts and the pattern made continuous. In the same manner with any other twill or simple pattern, the number of heald shafts required is governed by the number of separate threads contained in one complete pattern. In such cases as simple twills or other straightforward patterns, it is usual to draw the warps through the healds in consecutive order, but it is in the combination of a broken pattern with a straight one, or the combination of two different orders of interweaving that the question of drafting really comes in. And it is at the same time in this system of combination and rearrangement that the power of pattern producing lies. Another question connected with this subject which it is desirable to discuss along with it, is the influence upon the stability of structure of the cloth brought about by such combinations.

Then to take the most elementary feature of the work. Fig. 1 shows a simple four-thread twill running four threads in one direction, then in the reverse. The draft is shown immediately above it. On examining the pattern the fifth thread is exactly the same in its order of working as the third, and the sixth is the same as the second; therefore, the same heald shaft which carries one may carry the other. The pattern may be enlarged to any extent, any number of threads in each of the stripes, but the number of heald shafts would not be increased because it would be a mere duplication of threads identical with one another.

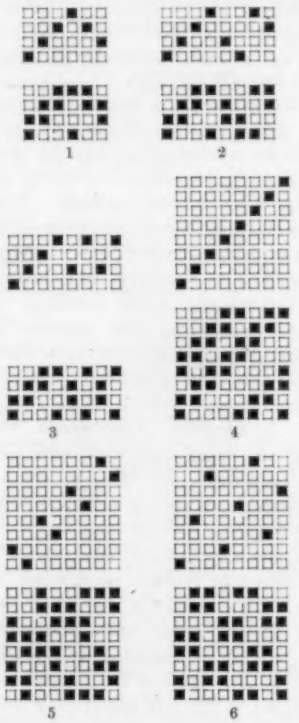
The method of joining the twills as shown in this illustration is often very undesirable, more especially when dealing with bold twills where the weft has a long float, for the reason that at the point of junction the length of the float becomes almost equal to two of the normal ones, and is liable to produce the appearance of a defect, and as a matter of fact becomes a defect. Then the plan shown at Fig. 2 is adopted where the weft float of one stripe is arranged to be opposite the warp of the adjacent one, and so prevents any long float of the weft and also produces a clear line of separation. As will be seen, this merely involves a slight readjustment of the draft and the same four healds will weave this as No. 1, and the stripes

again may be made of any size desired.

The next step is to produce different patterns in combination, and this may be done by varying the order of drawing one portion of the threads. Take Fig. 3, for example. The first four threads form a regular twill, but the second four would form a series of ribs presenting an appearance totally different to the twill; in fact, whilst one shows a diagonal line of pattern, the other would show a horizontal one, but from the fact that all the threads forming the rib are identical in their order of interweaving with some of those forming the twill, they could all be operated by the same heald shafts, as shown by the draft.

Assuming now that the ground has been somewhat cleared by the three simple illustrations given, the simplest known to the trade, the subject may be approached in a more serious spirit and discussed in all its most important bearings. This may be done by using well known patterns for the principal illustrations before going into the realm of probabilities. Fig. 4 is a common well known eight thread twill, and would be woven on eight-heald shafts with the threads drawn through in consecutive order. Fig. 5 has long been known as the "Campbell." The two present totally different appearances and produce totally different character of cloth, yet every thread in one is identical with one in the other. Take the draft over No. 5 as an index to the order of succession of the threads, and compare them with the corresponding ones in Fig. 4. Thus the first thread in Fig. 5 is identical with the second in Fig. 4, the second in Fig. 5 with the first in Fig. 4, and so on. Hence this new pattern is nothing more than a rearrangement of the first one; and the threads in either being identical with those of the other, they may be combined to produce new patterns, and woven together on the same number of heald shafts, as would be required to weave either of them separately.

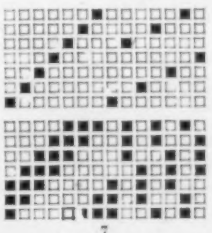
Again Fig. 6 presents an appearance totally different from 4 and 5, and would, in fact, make a different fabric. Yet it is the same thing arranged in different order. Take the threads in Fig. 6 and compare each, individually, with those of Figs. 5 and 4 respectively, as indicated by the order of the drafts, and every thread will be found to be the same. Consequently, any two of the three, or all the three may be combined in one pattern, and be woven on the same heald




shafts as any one of them used separately.

Now arises the question of the propriety of combining patterns of different character though coming from the same base. At first sight it would appear that the cloth made from each would have the same degree of firmness and stability, and, therefore should have the same combination of threads, from the fact that the threads composing each are individually interweaving with the weft in precisely

the same manner. But though they are individually the same, their altered relation to each other by rearrangement produces an influence upon the structure of the fabric as well as upon the pattern. Assuming that warp and weft threads are equal in counts and the picks of weft per inch equal to the ends of warp, Fig. 5 would be a much firmer and harder handling cloth than Fig. 4, for the simple reason that in the latter the points of intersection of warp and weft are following each



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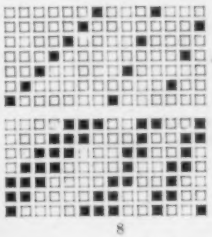

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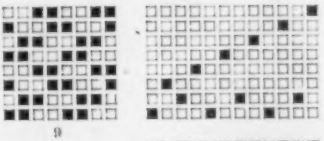

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other consecutively all the way through, whereas in Fig. 5 they are constantly crossing each other. As a consequence of this, although the two may be combined in the same cloth to produce a stripe or other effect, it would be most unwise to combine them in large masses, as the firmness of one against the looseness, comparatively, of the other would be liable to produce a "cockled" effect. This would apply also to Fig. 6, which would produce a cloth as much softer than Fig. 4, as Fig. 5 would be harder, from the fact that the threads are thrown together in pairs, and the points of intersection are not crossing each other in the same order. Strictly speaking the twill patterns should be applied to cloth of totally different structure, but it would be a bar to the production of all fancy patterns if combinations differing more widely than these do, could not be used. Yet it is necessary to have some regard to the relative qualities and characters of the patterns so as to use them in such a manner as not to be seriously detrimental to the cloth.

Two other examples are given, at Figs. 7 and 8, in both of which cases, although the second portion comes from the same base as the first, the combination should not be in large masses, but may be useful broken up in small quantities.

Now comes the most important part of this subject, viz: The value of a complete knowledge of the system of drafting, or, more correctly speaking, the rearrangement of patterns or their bases so as to produce new effects, and be able to determine readily the number of heald shafts required to weave it.

Take next, the small pattern Fig. 9, which consists of nothing but a simple rearrangement of a four-thread twill, two picks running to the right and two to the left, alternately, but an analysis of the warp threads shows that it consists of a combination of two separate weaves. The first and third threads are weaving plain all through, whilst the second and fourth are rising and falling two picks alternately. It might be said this is an accident of the rearrangement due to the smallness of the pattern, but the value of systematic observation of these results is that they lead to other combinations and frequently assist in the production of patterns by drafting on a small number of heald shafts, which otherwise might require a large number or even a Jacquard to obtain

a similar effect. Take for instance, Fig. 10, which occupies 12 threads, but being simply a combination of a plain weave and a six-thread twill, can be woven on eight heald shafts, as the draft shows. Now let anyone try an experiment for himself, as the design would take up too much space in these columns.

Take any two simple twills which occupy different numbers of threads, say one on four and the other on five, or one on five and the other on seven, and combine the two, end and end, just as in Fig. 10. The result is a big pattern, because the whole pattern is not perfect, until both the component twills are complete at the same time. Thus, with the four and five thread twills the pattern would occupy forty ends (twenty of each), and twenty picks, and will present variety because the two will have fallen into every possible position in relation to each other. Yet the whole may be woven with nine heald shafts, four for one twill and five for the other. In the same way combine five and seven end twills, the pattern will occupy seventy ends (thirty-five of each twill), and thirty-five picks. Yet it may be woven with twelve heald shafts. To add to the variety of patterns of this kind, and which may be woven on a small number of healds by drafting, one may combine two twills running at different angles, and decided figured effects result, for the reason that the twills will be constantly intersecting each other and in every possible position in relation to each other.

There is practically no limitation to the power of producing variety of pattern by these methods of combination, and yet be working with a reasonable number of heald shafts; but, as pointed out before, there is always danger in combining two different patterns, or patterns coming from the same base, but of different degrees of firmness, in large masses. The more intimately they are intermixed, the less liability for one to work up tight and the other slack in the cloth.

Although the principle of combination is of immense value in itself, it is perhaps secondary to that of rearrangements, because the latter can be used in combination, hence giving double power.

(To be continued.)

## The Science and Practice of the Construction of Woven Textures.

*FRED BRADBURY.*

(Continued from October.)

Having already dealt with the essential points of fulling and finishing and the construction of the woven texture in respect of the number of threads of warp and weft, including their relative angles of curvature, and thus shown their importance as factors to be fully considered in the production of dressed-face fabrics with a good cover, there remains now only to consider the quality of the woolen filling, including its preparation and manipulation during the scribbling, carding, condensing and spinning operations, to produce an even surface. Though these processes must necessarily be prior to manufacture, yet, here it has suited my purpose better to treat of them lastly, having first dealt with "cover" and gradually worked backwards to the spinning, showing in each case how the obtained result depended on the operations preceding it.

The quality of the weft material used for each of the fabrics Nos. 1, 2 and 3, represented at Figs. 26, 27 and 28, respectively, was identical (August issue 1898), being a typical quality of fine wool. The resultant yarns, however, showed a diverse result, as Figs. 32, 34 and 36 fully demonstrate.

Fig. 32 is a photomicrograph of a portion of the weft extracted from cloth No. 1 and is a fair sample of the yarn in this fabric. The most casual observer will notice the thoroughly even character of this representative thread of weft, but turning from this illustration to Figs. 34 and 36, which are photomicrographs (with different

objectives and under different conditions), of the weft extracted from cloth No. 3, and which is thoroughly representative of the filling material employed in the structure of both textures, Nos. 2 and 3.

Fig. 34 is a representation of the weft thread as it lies in the cloth and as it would be seen in a cross section of the cloth through the warp. Hence in this illustration the angle of curvature of the weft is prominent; the most important point to which the reader's attention is invited is the unevenness of the yarn. The illustration shows a thick place, which a long-

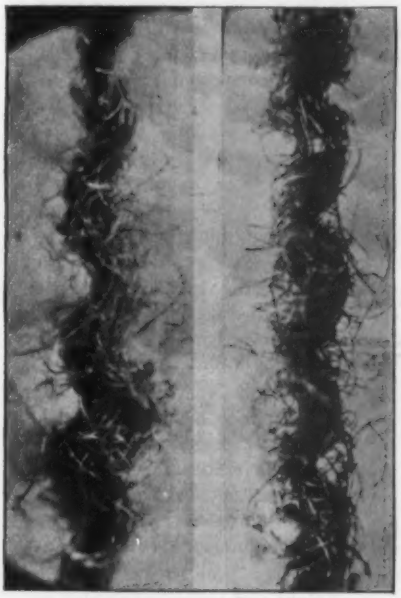

FIG. 33. FIG. 34.

er length of yarn revealed the existenge of, at several similar places in addition to thinner parts. Many of the thicker portions, when subjected to a minuter examination, appeared as though several short fibres had rolled around each other and been entwined into a small hard lump or knot.

The illustration at Fig. 36 was obtained from the yarn as it rested in a position most natural to its tendencies of rest. It, nevertheless, also reveals very forcibly the unevenness of the yarn—the greatest defect perceivable being a thin place.

The weft material in No. 2 cloth is identical with No. 3, hence it is not necessary to supply illustrations. The defective characteristics developed in the weft yarns of these two cloths was one of the factors which contributed to the inferiority of Nos. 2 and 3 textures as compared with that of No. 1.

Some people have erroneously contended that any irregularity of a woolen yarn is a small matter, which can be ignored when the goods for which yarns are intended have to be subjected to a milling, raising and brushing process. Thus, for example, one writer recently stated: "It is generally understood that the fibres of woolen yarns hardly dispose themselves so regularly as those of cotton, consequently the ooziness of one is more marked than the other. This is due to the spreading character of the fibres. Therefore, a glance at the opaque illustration of the yarn shows how irregular the yarn really is, but as weft yarn it is well adapted for filling up the intersections of the woolen fabric." Nothing could be further from the truth.

We have already given sufficient data to enable us to arrive at the following conclusions: First, that the most perfect "cover" is obtained when the fabric is properly constructed, as set forth in the preceding pages, and with a sufficient margin as will allow the dyer, fuller and finisher to operate with his advantageous processes. Second, that the evenness of the surface of a dressed-face fabric is due almost entirely to the regularity of the yarn. Hence it becomes advisable to consider, if only briefly, a few of the essential points in woolen yarn manipulations, which are factors contributing to the production of a good even woolen thread.

The fundamental principle of all good carding is to secure a complete separation of the individual fibres, which necessitates as a cardinal prin-

ciple, that the finer the stock the finer must be the card wire and the more numerous must be the points over any given area of the card clothing.

Further, a spinner who seeks the custom of a manufacturer using all woolen yarns for dressed-face goods must not be too anxious to get a large quantity of stock through the carding machine, for he will not only reduce relatively the carding surface and thus tend to neutralize any good opening and thorough equalization of fibres, but may unexpectedly receive by some morning post a debit note for defective pieces, caused by uneven yarn, of which he has, unconsciously or otherwise, been the cause.

No possible advantage can be claimed by allowing the fibres of wool to pass rapidly any point of the carding surface. The artificial arrangement of the fibres in the carding machine, though not intended to be permanent, is a factor which is very important in assisting in the production of an even yarn. The self-acting mule is the principal mechanical element in the arrangement of the fibres and construction of the woolen thread.

For fine wools the card wire should possess as perfectly smooth a surface as it is possible to obtain, so that the delicate fibre may be preserved from injury as much as possible. Since wool in its natural state is matted, it should be the aim of every producer of woolen yarn to open the staples with as few breakages as possible, which means that the card must not be too full of wire, but yet of sufficient strength and number as is only necessary to adequately deal with the stock to be opened. The attainment of this object may be facilitated by using wire in the leather clothing of the licker-in, a cross section of which is an oval figure, and necessarily so arranged in the leather foundation, that the resistance of the stock is opposed to the greater diameter of the card wire.

As the material becomes more disentangled a greater carding surface is necessary, i. e., more wire points in contact with the stock carding. The ideal should be to treat the individual fibres as much as possible. Round wire is the form best suited for increasing the carding surface as above, inasmuch as it aids the object without having the cloth too full of wire, assuming that a system of even distribution is adopted. Twill and rib systems of setting are among the best. The treatment of the individual fibres is assisted partially by the pointed form of tooth. It is invariably admitted that the nearest approach to a needle point is best adapted for this purpose, partly on account of its ability to pierce the stock and draw away the material in finer quantities instead of bulky portions. Though the needle point is not yet fully attained, it is well to always keep in mind the ideal.

Fine wool carding also involves that the card cylinders should be more closely adjusted than for those of medium or longer stapled wools, for the simple reason that it is necessary for the points of the card wire to be nearer each other so as to be able to thoroughly operate upon as many of the fibres, individually, as is possible, without causing any breakage of fibres. The space between the rollers, also, must necessarily be decreased as the material reaches the finishing end of the card and has thus become less entangled. This setting of the card cylinders for fine wools should never be done by simple judgment of sight and hearing, but always by mechanical means, such as the employment of gauges, based upon the Birmingham wire gauge or any other fixed system. The count of wire gauge best suited for each pair of cylinders may be determined by experiment and judgment with this favorable advantage, that each test and result may, in a numerical sense, be systematically recorded for future reference and guidance, whereas, on the contrary, one cannot record minute distances apart, of cylinders, by simple judgment, to satisfy the numerous

portions of the carding engine and the various kinds of material. In determining the surface velocities of the various card cylinders, the carder's judgment may, to a certain extent, be exercised with less detriment to the stock in process of carding than would be the case in the former instance. The cardinal principle, that the rollers which strip, draw, open and carry forward the stock should have a greater surface velocity than those rollers which partially hold or retain the wool, must be well borne in mind.

However good the carding set may be, its utility will be impaired if a periodical and thorough cleaning be not maintained. Occasionally the machines are allowed to run until some cylinders are so thoroughly embedded with small entanglements of short wool that only a very small portion of the card wire is visible. Consequently the work turned off is proportionately inferior in good, sound and even yarn. The accumulation of fibres into small knots, technically known as neps or motes, frequently pass into the carded material, being observed in the sliver as it leaves the various cylinders. These are a serious detriment to the production of a good, even yarn in the drawing or attenuating process upon the self-acting mule.

Too much attention cannot be paid to the breast and its complement of rollers for opening out the matted portions of scoured wool and so preventing its being carried forward with comparatively little disentanglement, with the result that subsequent rollers have work to perform which they are less able to do. I have seen the above various accumulations of fibre very much increased in the carded wool by attempting to card a fine wool upon a set of cards more suitable for medium staples. Many people seem to fall into the error that the same kind of card may be used successfully for various classes of wool, providing the card teeth are arranged to suit the peculiarities of the material which it is required to manipulate. Upon prosecuting an inquiry into the different processes of manipulation of the weft yarns used in Nos. 1, 2 and 3 textures, I found that, though the raw material was identical in quality, the preparation of the yarn for No. 1 cloth had been entrusted to a different carder and spinner than that produced for Nos. 2 and 3 fabrics, which were made upon the same machine. In the case of No. 1 weft yarn (Fig. 32), the various machines were all suited for dealing with a fine stapled wool and kept in good working order; the sliver was condensed to 4½ to 5 skeins (Yorkshire), and drafted out upon the mule to 9½ skeins, which is about equal to a draft of two, whereas in the manipulation of the fibrous material for Nos. 2 and 3 weft (Figs. 34 and 36), the fineness of the wires in the card clothing was throughout of a coarser set than would generally be considered suitable for fine wools which are intended for dressed-face goods; and, finally, the material was condensed from 6 to 6½ skeins and attenuated upon the mule to 9½ and 10 skeins, equal to a draft of about 1.6 or, as will be observed, to an attenuation upon the mule frame of about 20 per

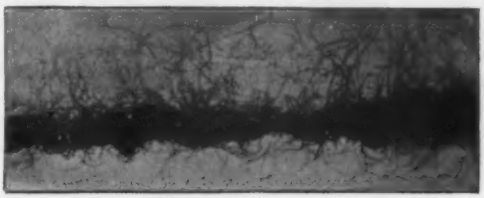

FIG. 36.

cent. less than the weft for cloth No. 1.

This at once raises the important questions: How near the required count is it safe to condense? and what amount of draft upon the mule is productive of best results? Various and diverse may be the opinions on these points, but an all-wool, of good quality, should, to my mind, never have a draft of less than two, i. e., a carded sliver condensed to 10 skeins, should be drafted to not less than 20 skeins upon the mule.

Since the mule frame is generally admitted to be the chief mechanical agent in producing the artificial arrangement of the fibres of the modern woolen thread, it becomes increasingly evident that it should, at least, have a fair opportunity of exercising its proper influence upon the material, for, by the simultaneous drafting and twisting of repeated lengths (stretches) of thread, the fibres are caused to become arranged in a manner peculiar to the various lengths of fibre composing the sliver, which, though they cannot be said to be parallel, as in the case of a typical worsted thread, have nevertheless a specific arrangement.

No doubt to a casual observer the woolen thread may appear to be a mere conglomeration of fibres arranged in every conceivable direction, yet investigation reveals that the specific arrangement of the fibres composing the woolen thread may be defined thus: The longer fibres are arranged along the central axis or core of the thread, while the shorter gradually twist around the central axis of the longer fibres, resulting in a compound thread of varying lengths of fibre, forming a spiral twist around the central axis with every specie of fibre fringing out from the circumference.

The typical woolen thread is a factor which materially contributes to the milling or adhesive properties in the subsequent processes of dressed-face goods, due to the natural tendencies of the yarns to interlock with each other at the first opportunity and so produce a compact structure. Consequently all the foregoing resolves itself into the following: The manufacturer should and usually does know what the complete requirements of the finished fabric are. Then he should seek to obtain these characteristics from the initial stages and not leave them to be obtained by later processes which, inadvertently, are sometimes considered more important factors in contributing to the production of the required result. It is unwise to assume that blemishes or deficiencies in the preparatory stages can be totally remedied or covered up in the succeeding operations.

Hence in our concluding remarks upon dressed-face fabrics we venture to assert that it is not only essential to make a proper selection of suitable materials, but every process of manipulation should be thoroughly adapted to the material in preparation. Further, in briefly recapitulating the sectional conclusions of previous note, we repeat in a more collective form that no satisfactory finished fabric need be contemplated, however perfect the machines may be, without giving minute attention to the minutest details through all the multiplicity of processes from the raw material to the finished product.

Finally, summarizing the results of our investigations, the best and most perfect "cover" of weave on the surface of the cloth is primarily due to the construction of the cloth and to the fulling and finishing operations, while the most even surface of texture is obtained by the regularity and uniformity of the woolen weft used in the manufacture of dressed-face textures.

(To be continued.)

—A business career that goes by fits and starts will not pay so well in the long run as a business that follows a course mapped out for it and keeps increasing its advertising as the business demands it until the maximum is reached.

### Chinese Carpet Wools.

Sixty-four per cent. of the imports of wool into the United States, for 1897-98, consisted of wools for our carpet manufactures, over 25 per cent. of which came from China. The exportation of wool from China is a growing trade of a comparatively recent origin. The first consignments from the province of Szechuan were sent from the interior to the coast only a few years ago. It is not until one reaches the extreme western or northern borders of the Chinese provinces that he meets with any flocks of sheep, and it is from Ta-chien-lu on the Thibetan border, and from Sung-pan, in the north of the province, that the wool at present exported from Chungking is derived. A portion of this wool is sent by river, while some of it is carried partly by pack animals and partly by river. The wool is of good quality, long in staple, soft to handle, but arrives in a bad condition, being wet and dirty. Of the whole deliveries, not more than 10 per cent. are clipped fleeces, the bulk being in rope form, while all qualities and colors are lumped together, rendering careful sorting by the exporter, a necessity before being marketable. The bulk of this wool is forwarded to New York, to meet the demand from American carpet manufacturers, but this trade, like all others at this remote centre, is hampered by heavy charges and costly transport.

### Child Labor Law.

It will soon become a rare thing in New York State to find a child under fourteen years of age at work in a factory or workshop. In the past, it has been very easy for a child who has been sent out of a factory by the inspector, to go back quietly again after the inspector has left, but now, through an understanding between Chief Inspector Daniel O'Leary and all local school authorities of the State, the moment a child under the age limit is found, his or her name is given to the local school superintendent or other person in charge, on blanks furnished by the factory department and the child not only leaves the factory, but it is certain that he or she attends school. This arrangement has worked very satisfactorily for the time of its existence, for already many children have been sent to school who otherwise would grow up in ignorance.

This arrangement makes very effective "truant officers" out of the deputy factory inspectors, and with but little additional labor on their part.

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—United States Commercial Agent Atwell, writes from Roubaix, that the local chamber of commerce has addressed a plea to the French Minister of Commerce in behalf of favoring the textile products of that region in a reciprocity treaty with the United States. Voluminous statistics on the subject are to be submitted to the French government, which will be urged to do all in its power to secure for the manufacturers of Roubaix the benefits to be derived from the application of the reciprocity clause.

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—It has been considered that barwood exerts some specific influence upon the indigo, apart from its effect upon the shade produced. Statements have appeared that the indigo rubs off less, and is attracted in larger quantities, when the wool is previously dyed with barwood. This is, however, not the case; there is no inherent advantage in boiling with barwood beyond the modification of shade, which is produced thereby, and other dyestuffs, which give a similar color, and which are not affected by the vat ingredients, may be used instead of barwood.

—Amongst the older artificial dyes, the use whereof has for some time been abandoned, two of the most interesting are resazurine and resorufine.

# KNITTING DEPARTMENT.

## The Knit Goods Situation.

The sharp winter weather so closely continued for this season of the year, and Christmas, coming together, have given the trade brisk business, with promise of more. The markets, taken altogether, are not such as to warrant pessimistic views, yet an analysis of the situation does not indicate much advance. A steady, sizable volume of traffic is about all that can be expected, unless there is a material change in general conditions. Cotton seems to have turned from bottom, and wool is steady. A general feeling of buoyancy is as prevalent now in the world of commerce as depression was a little more than a year ago. The government disbursements for war are getting into the hands of the masses.

But to particulars. In hosiery, cotton goods are rather backward, although staple and fancy lines are in increasing demand. The supply is too large, however, to permit of better prices.

English manufacturers of cotton hosiery cannot feel hopeful on present business, although their spring trade is likely to be decidedly better.

Chemnitz is holding prices remarkably well, in view of the relatively small number of buyers and the shrinkage in fancies.

By the way, fancy seamless hosiery is in fully as poor request as other fancy lines. There is no exception to the frost in this department. It is thought that there will be an increase of hose with adjustable welts. There are enough mourners among makers of golf hose to form a consolation meeting. It was another case of "the more the merrier," until a certain point, from which the reverse was true. The weeding out, now in progress, will give careful, well-equipped manufacturers comparatively easy sailing in 1899.

The over confident people on fancies are extremely busy now—in crawling. They have got as far as to admit that the domestic market is "somewhat demoralized." Somewhat is certainly good. It is now more than six months since The Textile World began emphasizing the danger in this direction, after previously advising caution. Pure silk embroidered goods are to be ventured the coming season.

To turn to underwear. The recent spurt on heavy goods has added courage to light-weight prospects, and it may be said the trade is in a state to accommodate all of this prosperity that puts in an appearance. Judging from the compressed spring buying already seen, there is much more to come out. The intense heat of last summer can hardly fail to have an effect here, for stocks generally were depleted in consequence.

There is widespread expectation that the fall trade will open soon after New Year's with more promptness than for several seasons. Thus far, the talk about heavy weights for next year has been of the fairy-story order. Such orders as have been taken are nearly all of a provisional sort. "Indeterminate" is an expressive word to use in this connection. Prices show little change, and more's the wonder, for the motto of the selling agent has peculiarly been of late, "the devil take the hindmost."

Low grade goods continue to engage the bulk of attention. The fall offerings show more taste and care in design and workmanship than for some time, and cannot help proving a factor in their distribution, it is so noticeable. Jersey goods, for the time being, at least, are crowding flat stuff. When you come to think of it, the

jersey will stretch so that dealers are not obliged to carry nearly as many sizes in stock.

Holiday trade will show a decided advance over last year. Retailers are buying freely, although the invoices show a great range of styles and sizes. Every few days brings the small dealers, who keep pecking away with the resoluteness of sparrows. Heavy knitted goods have sadly needed the clearing out which the low temperatures brought. Better margins are the thing most needful, but they are not likely to materialize unless the sharp spell is protracted.

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**Automatic and Semi-Automatic Hosiery Machines.**

*Editor Textile World:*

The inquiry of your Western subscriber in the November issue as to whether he had better put in automatic machinery, brings up the much discussed question as to the relative merits of the different types of machinery. I do not mean by this the different makes, but the broad types of semi-automatic, three-quarters, seven-eighths, fifteen-sixteenths and full automatics. It is a question that can be approached in the columns of a trade publication like yours only with great circumspection, for, as the comparative merits of different machines are very largely matters of opinion, it is not fair to exploit in your reading columns the advantages of any particular machines. But there are certain broad comparisons which may be made, and for the benefit of your Western inquirer, and perhaps for some others who may be weighing the same problem in their minds, I venture to set forth herewith some comparative advantages of the two types of automatic and semi-automatic machines as they appear to me from my experience as a manufacturer; and if my views differ from others who have also gained theirs by practical experience, I should be only too glad to be corrected, and hope to hear from them on the subject. I state frankly that my experience has been only with certain makes of machines in each class, and I have assumed them to be typical of their class.

First taking up the cost of the machines. As there are several different makes of both kinds of machines on the market, each selling at somewhat different price, it is difficult to come at a just average between the two classes. It is, however, my opinion, that as the average automatic knitting machine is more complicated than the average semi-automatic, it will cost more to manufacture them, and consequently costs more to install them in the mill. This extra cost is, however, I think, sometimes partially balanced in the long run by saving in repairs and wear and tear, for, as the former are entirely automatic, they make the changes in exact time, and so escape the jar and shock caused by unskilful knitters pulling them into gear at the wrong time, or rather trying to do so, thus breaking levers, clutches, etc. The question of the repair bill is dependent so greatly upon the machine itself, however, that perhaps a just conclusion can hardly be drawn between the two types on this point. A poorly built automatic will cost more for repairs than a well built semi.

Taking up the amount of production, I think the advantage is with the automatic machine. This is more marked on some classes of work than on others. If the production is plain hose, the automatic machine will run on continuously, making the heel and toe changes without stop, and putting in and taking out the reinforcing thread at the proper time, while the semi-automatic makes two stops each, at both heel and toe, while the reinforcing thread is put in and taken out, and the machine changed from round, to back and forth work, and back again to round work. The automatic also has another advantage on the cheap class of half hose, that are finished with a sewed-on top, and are sold to the retail merchants at from 40 to 60 cents per dozen. These

classes of hosiery can be knit on these machines in continuous strings, and afterward cut apart with shears; an automatic machine can probably produce twenty-five per cent., or more, of these goods, than a semi-automatic.

The difference between the two machines is not so marked on hose and half hose where the ribbed top is transferred on, as both must be stopped for this purpose. The automatic has the advantage that, when it is started, it does not again stop until the hose is finished. But this advantage is somewhat offset by the fact that the heel thread carrier on the automatic is usually in the way in transferring.

This superior capacity to produce would also obviate the necessity of purchasing several machines, as compared with semi-automatics, thus counter balancing the greater cost per machine spoken of above, and also saving something in floor space.

The cost of labor of knitting is also in favor of the automatic. Let us suppose that with both systems the knitters received $1.00 per day on an average. Making plain hose, an average knitter should watch and attend to fourteen heads at the same time, of automatic machinery. Each head will make three dozens a day, or forty-two dozens in all. At $1.00 per day, that is 2 2/5 cents per dozen. On semi-automatic machines, a knitter could not run more than eight heads, making 2½ dozens a day per head, or twenty dozens a day in all, for which, at $1.00 per day, she would receive 5 cents a dozen. In other classes of work the difference of cost of knitting would be in proportion.

Let us now consider the item of imperfections and waste made by the two systems. Here, in my opinion, I think the advantage is in favor of the semi-automatic, as my experience is that fewer holes requiring mending, fewer seconds, and less waste, is made on them than on the more complicated automatics. One reason for this is that the knitter has a good many more machines to watch, that they are spread over more space, and that consequently she can not as readily see a broken needle, or a slight imperfection, as she would if she had less machines and had them nearer together. Another fruitful source of imperfections in an automatic, is the heel and toe thread. Frequently this reinforcing thread fails to run in at the proper time, and the result is the heel or toe is often half made before the reinforcing commences. Then sometimes it fails to come out and runs quite a distance in the round work. This is the cause of a great many seconds. On the semi-automatics the heel and toe thread is put in and taken out by hand, and a careful operative seldom fails, hence fewer imperfections from this cause.

Of course bad work can be done by a careless knitter on semi automatics at just this place. I remember one instance which will illustrate this point. The goods in the case were all wool half hose, with a merino heel thread 50 per cent. cotton. One knitter in breaking this off often left the end so long that it reached into the first round of the foot some distance. As the goods were made of undyed yarn, these imperfections were not noticed by the inspectors, nor by any one until the hose were dyed, when a light streak was found part way across the instep, because the merino heel thread did not take the dye.

The variety of work done on a semi-automatic is a little greater than that of an automatic machine. Heels and toes of a different color from the body of the goods can easily be made as the machine stops at these points, and a different yarn can be substituted in place of the body yarn without any loss of time.

No especial difference will be noticed in finishing automatic and semi-automatic work, except in looping the toes of such automatic goods as are cut apart with shears. It will be found more difficult to ravel these down to the row of stitches on the looper points, and the amount of waste will be greater. To sum up, then, the ad-

vantages in favor of each machine will be about as follows:—

Automatic: Less number of machines necessary for a given production; less cost for repairs; less floor space required; less cost per dozen for knitting.

Semi Automatic: Less cost per each machine; less imperfections and less waste; less labor to loop; greater variety of work possible.

AUTOMATIC.

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[*Special Correspondence.*]

**Hosiery and Underwear in Chemnitz.**

I wish I could come to you with words worth recording. This reflects the activities, if such they can be called, of the last four or five weeks as well as anything I can say.

The hosiery world is waiting. I guess that is as good a word as any to picture the present position. Nobody knows just which way the cat will jump. The demand for nice lines is fair. Deep blacks, with brilliant white stripes, are still favorites. The deeper the black and the more brilliant the white the more willing are purchasers to pay an extra Groschen (2½ cents). Staples go well. Blacks are the favorites again. Some fancies are selling, notably very nice grades. At a seance, in the Kaiser, last night, O'Connell, Arnold Constable's man, one of the best informed men that come here, said: "No good salesmen will ever offer a large line to good customers, unless it contains nice fancies, and among these some nice plaids. I'll have the best in the market and all there is in the market worth having for my salesmen to show." This seemed solid and sensible. O'Connell ought to know—I believe Beers thinks thus. The fancies that are selling are very rich. Were last year's lots confined to such goods, the fall in fancies would never have been recorded. Richelieus, Rembrandts and ribbed are still running. I question whether the supply, in these lines, is up with demand. A few blues, some tans and other colors were sold, but in by no means big bunches. England and the East are making up for much that was lost in Canada and the United States by the new tariffs. Is it not interesting as well as surprising, this sending of Saxony's textiles to England? Talk about carrying coals, etc., to Newcastle, England, so say Saxon knitters, is waking up. A few of her most thoughtful men, like Sir Swire Smith, recently knighted, Sir Philip Magnus, Mr. Redfern of the Kensington Museum and Mr. Quilter, editor and proprietor of the Knitters' Monthly, are making public opinion and propaganda in favor of better textile and technical schools.

The glove trade was never better, certainly not since McKinley's bill began to bear down heavily on the products of these parts. The leading lines are nice lisles, silks, half silks and satins. It is doubtful whether even the biggest and best houses can carry more orders than were booked weeks ago; that is, whether they can fill on time. The biggest buyer is not the United States, but France and England. It is astonishing how many France has taken. Buttons are still the rage. No one wants anything else. Some lisles that I have seen are perfectly "lovely," and the price, considering quality and finish, ridiculously small. Of course they must be, to make way in your country against kids.

Here a falling off in underwear is recorded. Of course it is hard to say whether half that one hears is so or not. Some houses have their hands full. These are houses that have always held to the very best business maxims. Sporting goods, successful so long, are giving way to sweaters. Golfers, cricketers, boat men, hunters, bikers, etc., go in more and more for the sweaters. They look ugly, anything but esthetic, but they are comfortable and they prevent colds. Recent estimates put the exports to the States, during October, at a little over $100,000; cotton and woolen hose, less than $2,000; cotton gloves about $8,500;

silk, a little less than $2,000; woolen gloves, $8,000.

How hard a time manufacturers are having, to hold the United States market, will never be known. It is astonishing how successful they are in some lines. Of course this is in grades you have hardly begun to make, above the $1.25, or $1.50 to $2.00 limit. The time was, back in 1890, when Saxony sent more goods, certainly almost as many, to the United States, than to all other countries combined. All this has changed or is changing.

ARISTIDE.

Chemnitz, Saxony.

## Making Hosiery.

*Editor Textile World:*

Western manufacturer's inquiries in November number are hard to answer in a single article for publication; and to fully explain the matter would take several exchanges of correspondence; but if it can be boiled down to plain facts I will make a brave effort to do so.

In the making of children's ribbed hose, 5 to 9½, the average weight is from 1.6 to 2 pounds per dozen, the heavier the goods generally the coarser the gauge, although sometimes a heavier yarn is used. As to size of machines for this class of work, I will give a list, or table, from which he can form some ideas, and not go astray if he should adopt the same.

| Size. | 5-5² | 6-6² | 7-7² | 8-8² | 9-9² |
|---|---|---|---|---|---|
| ⅞ Auto. Knitters.... | 2½in. | 2⅝ | 3 | 3¼ | 3½ |
| Ribbers..... | 3¼ | 3⅝ | 3¾ | 4¼ | 4½ |
| Needles in ⅞ Automatic ..... | 92 | 100 | 108 | 120 | 128 |
| Needles in Ribber.. | 132 | 140 | 148 | 160 | 168 |

Use about 10s to 12s single yarn.

The leg is always made with more stitches than the foot, which necessitates putting two stitches on one needle when the top is transferred. This, also, determines the cost of knitting, more or less, as the quantity of doubled stitches are increased or diminished. The same diameter machines can be built with more or less needles as desired by manufacturers. Goods made on above machines in the East would cost about 60 cents per doz., and sell for about 75 cents, to weigh about 1.8 average.

Your Western manufacturer's competitor is probably making a cut foot stocking, or not paying his yarn bills.

Half hose made on 3¾ inch ⅞ automatics, rib top, made on 4¼ inch ribber, in 160 to 200-needle goods, are salable in weights of 1 to 1¼ pounds, costing from 45 to 65 cents, and selling from 60 to 90 cents per dozen. Goods of 160 and 176 are good sellers, and "standard" ladies' hose are made on 160 to 200-needle machines, average weight 1-12 per dozen, and will sell at from 70 cents to $1 per dozen.

Knit all goods in the gray and ship to some reliable fast black dyer. Goods finish much better when done this way, and there is less liability of seconds and mending. Should advise starting on cotton, as there is less risk to take in making the experiment. The several makes of ⅞ automatic knitters have their faults and also their virtues. One should use his own fancy in a selection of machines.

KNITTER.

## Making Hosiery in a Small Mill.

*Editor Textile World:*

I notice in your November issue what "Hosiery" has to say in regard to running a small hosiery mill in the West. Now a man to do a small business has got to be a practical knitter and work himself and look sharply that there is nothing wasted. I am running a small knitting mill in the West and I find no trouble in meeting competition. "Hosiery" must either pay too much for his yarn, or too much for labor. I am probably using the same kind of machines that he is. I will admit that a large hosiery plant with automatic machines can make goods cheaper than I can, but to offset that item I have no agent or superintendent drawing a big salary, or two or three bosses to pay. I am my own boss and fixer. I would advise "Hosiery" to investigate

and see if there is any possible leak where his profits are going. I find that I cannot make cotton goods and compete with the East. I make nothing but wool goods. I find that rib goods pay the best as they cost less to make and are better sellers. If your correspondent will write me, perhaps I can give him some information how to make a profit with the machines he has.

UTAH.

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## The Universal System of Winding Yarns.

The importance to knitters of receiving their yarn in a shape that can be readily used without waste or breakage, requires no comments from us. Much time and money have been expended in experiments toward improving methods of winding yarn, to meet the economical requirements of knitters. The method in common use for the last number of years, has been that known as "drum winding," in arranging the yarn in a conical form. The machines used for this latter purpose have been of two types, one an English, and the other an American, invention. The mechanical structure of these two machines, though dissimilar, have effected, practically, the same results.

The latest improved system, known as the Universal Winding System, is meeting with remarkable success, as was impressed upon us during a recent visit to the office of a large yarn merchant, whose numerous inquiries for yarns wound according to it, were shown to us. We are convinced that its general introduction is simply a question of time, not only for use in knitting, but in weaving, mills, the latter for loom shuttle cop winding, with a prospect of its introduction into the processes of warping and beaming.

It has been, we believe, the almost universal custom of knitters, heretofore, to rewind a part of the yarn received by them, on the ordinary drum wound cones. Now, it can be readily understood that it would be greatly to the advantage of knitters if the yarn received by them could be delivered to their knitting machines in a proper condition, without the expense of rewinding. The less handling the yarn receives after it is spun, the better is its condition for application to the knitting machine, as each handling, or winding, strains, roughens, or otherwise damages the yarn to a certain extent.

Yarn for the knitting trade has heretofore been shipped on mule cops, to be wound in the knitting mill, or has been primarily wound in the yarn mill in conical form upon drum winders, for shipment. In the first case, the mule

cops are frequently broken and damaged in transportation, producing much waste in rewinding. In the second case, it entails the rewinding of the drum wound cones, making an extra handling of the yarn, with extra machinery and operatives. When the yarn has been wound from the mule cops, or rewound from the drum wound cones on to bobbins, the delivery of the yarn to knitting machines is not always uniform, producing uneven knitting and the clouding of the fabric.

From the illustrations which accompany this article, it will be readily seen that the Universal cone is a distinct improvement over the drum wound one. After considerable legal

contention before the United States Patent Commissioner, a patent has been granted, on the peculiar method of winding yarn, to the Universal Winding Company, Boston, Mass., of whom fuller particulars can be obtained.

The machine upon which this system of coning is done, takes the yarn from the mule cops, or frame bobbin, with absolute regularity, and winds it in conical form, with uniform tension, and with such accuracy that when placed upon the knitting machine the yarn runs from start to finish with equal freedom, and produces a uniform fabric. The yarn is handled by

DRUM WOUND CONE.

this machine in such a way as not to impair its strength or surface, and is in perfect condition for delivery to its ultimate purpose. The yarn is cleaned from loose slubs or specks, by running between polished steel fingers, arranged to deflect the path of the yarn, and bear with uniform resistance against the surface. The tension of the Universal machines is susceptible of the most delicate adjustment, and can be adapted to winding the most delicate yarns without straining them.

The Universal cone winder, in addition to handling the yarn with absolute uniformity, cleans it of loose imperfections; and winding all the coils—crossing the yarn regularly without intervening spaces—builds the same into conical form under the most favorable conditions for preservation and for delivery to the machines upon which it is used. The winders are built to run at very high speed, thus effecting a large saving in floor space in the mill. Their construction is such as to facilitate the handling of the yarn, enabling the operator to turn off a larger quantity of yarn per day than on ordinary winding machines.

The agent of a large yarn mill writes, in regard to the saving effected in his mill, by using the Universal cones, that he can put into a given size packing case, over 70 per cent. more yarn wound according to the Universal system, than by any other system that he ever tried, thus saving cost in cases, handling and transportation.

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--The great difference between fancy and plain flat knitters, is that the fancy knitters have two sets of beds, whereas the plain have only one set. In the two sets, one set is for designing, while the other is an ordinary set. The designing needles differ from the plain by having an additional shank lying in tricks under them. On these the designing cards work, and accordingly when they are punched, so the needles may be in or out of position, so that a different lot of needles may knit at each course if desired, and as the different colored threads are used, those needles knit where that color is to appear in the design, and when another color is used, then the needles knit which have that color in the design. In designing and nopping machines the needle beds are deep enough to allow of two separate sets of cams working across the machine. The needles are then of two lengths, so that the top set of cams act upon the short needles, and the bottom set on the long needles, and each set work independently of one another, as regards position to act on the needles, but the whole of the cams act together.

—The Spinners' Section of the Austrian Cotton Manufacturers' Association, has proposed a conference with a view to an agreement for a general curtailment of the production of cotton yarns in Austria. It is, however, reported from Prague that several of the largest spinners in Bohemia have declined to reduce their output on the ground that they have no intention of increasing the number of their spindles, on the one hand, and see no necessity for a reduction of those running, on the other, as they are fully employed. Apart altogether from the movement for a curtailment, special efforts are being made to extend the markets for Austrian cotton yarns in Russia, where the quotations seem to offer a much wider margin of profit than the prices in the Austro-Hungarian home markets. It is admitted, however, that there are many difficulties in the way of Austrian competition with the cotton spinnèrs of Russia. The spinning industry in Russia and Poland is organized on a much larger and more effective scale than in Austria, it is supplied largely with native cotton and is protected by high import duties. Moreover, the Russian Government is contemplating a further advance in the tariff.

—Every effort is being made to reduce the items that enter into the cost of cotton after leaving the plantation. The latest one in Texas is that of a new rule established by the Railroad Commission of that State, prohibiting railroads from paying more than eight cents per hundred pounds out of their freight rate for compressage. This, of course, means that the compresses shall receive eight instead of ten cents per hundred pounds, or 40 instead of 50 cents per bale. It appears that the large compress companies, like those established at Houston and Galveston, do not feel particularly uneasy about the matter, but apparently rather favor it, because of their anticipation that it will crowd out the interior compress companies, so that they will get a much larger proportion of the business than heretofore. Their surmise seems to have some foundation, from the fact that all interior compress companies are protesting vigorously against this rule, saying that they cannot live and do business at this low charge.

—According to a recent publication of the Belgian Minister of Industry and Labor, the number of technical, trade, commercial, and domestic economy schools subsidized by the Belgian government is 410. In 1896, the number of these institutions was 376. During 1897, three apprentice shops for boys were closed in West Flanders. Among others the following institutions for boys were established during the same year: A weaving school at Oostacker, and a school of design and weaving at Anthines.

—There is a consensus of intelligent opinion that the next great American development will be the covering of the Pacific Ocean with fleets of steamships, and that it will be followed by the resumption of our old-time position on the high seas, when the flag of the United States was seen in every port.

## Odorless Oil.

Our attention has been called to an oil which was recently put on the market and which, if the claims of the manufacturers are substantiated, as they seem to be, will prove very useful for knitters, insomuch as it will do away with the necessity of washing the goods to rid them of oil. The manufacturers of this oil claim that it does not turn rancid, and no matter how long they may be packed, on removing the cover of the box, there is no disagreeable odor. We are informed that a certain knitting mill has been using it in the manufacture of sweaters, and does not wash them out after they are made, and is getting most satisfactory results.

# POWER DEPARTMENT

ELECTRICITY—STEAM—WATER.

## Riding Cut-Off Valves.

*W. A. MORRISON.*

The term riding cut-off valves, as applied to the steam engine of today, is quite different in its meaning and application from what it was fifty or more years ago.

Anyone who was familiar with the few varieties of those days, also with those that are prominent today, and has watched with a good deal of care the various stages of progress and vicissitude which have marked their path, can readily exclaim, "Is there much that is new?" In the valve itself, nothing; but in the application of scientific principles governing its action, everything.

Previous to 1843 very little had been done in regard to using an independent cut-off valve operating with its own eccentric. About that time, however, Otis Tufts became known as the noted stationary engine builder of the day.

Considerable progress had been made in river and sound steamers in the vicinity of New York and Philadelphia, which led the builders of steam machinery in these cities to turn their attention to the best form of engine for side wheel boats. The result was almost invariably the beam engine with long stroke for both steam and exhaust, having poppet valves with little or no cut-off, which was fixed as then understood. Few gallows frame upright engines had been built for boats.

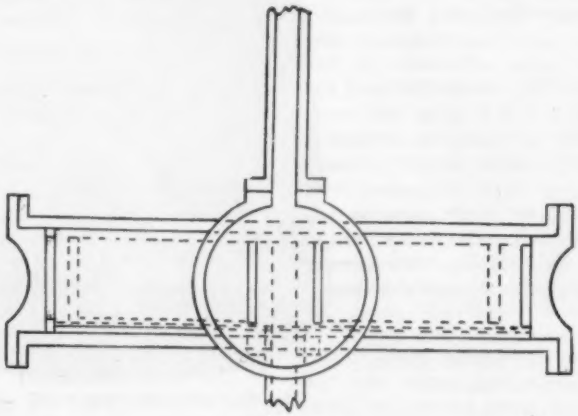

Fig 1.

Several years later, Sickels introduced the variable cut-off, that is, it was made so by the engineer changing the position of the cams as his judgment might deem best to produce the required result, which was done while the engine was in operation.

This all occurred previous to the advent of George H. Corliss, his first pa-

tents being brought about in 1847 while in the employ of Fairbanks & Bancroft at the old works at India Point, Providence, during the time he was draftsman there, He being the first man to make a successful application of the drop motion cut-off, as adapted to the main valves of the engine to control the speed by the action of the governor, Bolton & Watt having applied the principle in connection with poppet valves many years before without success.

Otis Tufts, previous to 1840 had been in business some time as a builder of hand power printing presses, having a shop on what was called Sea St., now Federal, Boston, about in the vicinity of East St. In 1845 the writer was employed at the shop on Hawley St., in the rear of Trinity Church, both shops being operated at this time by Tufts.

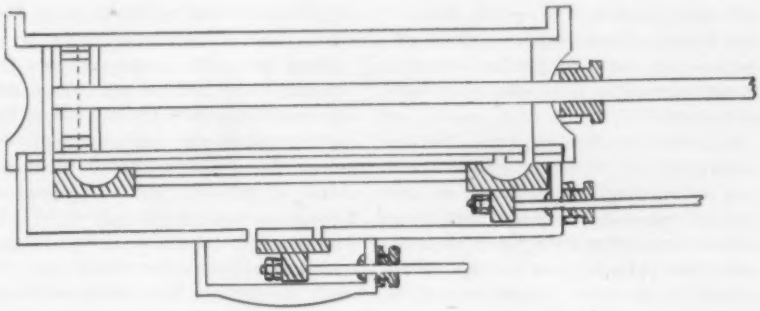

Fig. 2.

But few large engines had been built at this time, but these were very successfully worked, as the workmanship was first class in every respect, which, more than anything else, made his business a success.

Not long previous to this, Tufts invented what he called his cut-off expansion chest valve. This was round in form, and located outside of the main steam chest, with a short valve operated by a separate eccentric, two ports opened into the cover of the main steam chest which served as the valve seat, thus as he claimed, developing the expansive principle before reaching the ports of the main valve which were at each end.

This was a stepping stone to the riding cut-off valve which soon made its appearance.

Allen & Endicott, of Cambridgeport, were the first in New England to introduce it on their horizontal engines, by extending the steam chest the whole length of the cylinder, containing both long valves, the cut-off riding on the back of the main valve.

Chubbuck & Son, Boston, also introduced the same plan on their upright engines soon after.

Adams & Co., afterwards the Fulton Iron Works, Boston, and later McLaughlin & Son, built their engine on the same plan, the steam chests being all on the side of the cylinder, the lower edge towards the ports. A spring on the back was usually used to keep the faces of the valves against the seat. All these different builders used two eccentrics.

Today advanced engineers, both young and old, would smile at the idea of placing an expansion steam chest outside of another, with ports and valve to hold the steam while it expanded, expecting after the steam had passed through the main port to expand still further in the cylinder.

While Otis Tufts was a leading man of his day, he very cooly said to the

writer when about to make an engagement to enter his employ in September 1845, that he believed he had got perfection in the steam engine, yet within ten years Corliss had taken possession of the field, and Tufts was compelled to abandon the steam engine business, and turned his attention to the elevator business, which has become a great success.

Just before the advent of Corliss, the English builders had made considerable advance on the other side of the ocean, in short stroke fast running engines, and as the feeling in this country was in that direction, Corliss found that it must be discouraged, for he saw he could not at that time, make his automatic drop cut-off work, with high speed and short stroke. The career of short stroke high speed engines was short, for Corliss soon obtained the field in this country as well as Europe.

In 1856 the Burden Iron Works, Brooklyn, N. Y., commenced the business of building a high grade of stationary horizontal engines with long main slide valves with ports at each end of the cylinder, and having riding cut-offs with steam chests on top of the cylinder.

This style prevailed in New York and throughout the West, wherever stationary engines were beginning to be built, the application of the steam chest to the side of the cylinder being confined almost exclusively to the New England states.

In the early sixties, a number of good variable cut-off engines were built with the riding cut-off, among which were the Babcock & Wilcox, invented by Geo. H. Babcock. The cut-off being operated by the pressure from the steam chest, controlled by auxiliary valve operated by the governor.

In the fall of 1866, the writer went to the Erie Basin Iron Works, Brooklyn, as superintendent, where a number of these engines were built, and proved satisfactory for some time, but the mechanism was too costly and complicated for general use, being liable to get out of order.

The Buckeye engine, of Salem, Ohio, another popular engine, having a riding valve, was introduced about 1864, meeting with great success today.

Previous to 1860 a number of variable plain side valve engines were built with independent cut-off valve and eccentrics; the engines were all horizontal and had a screw attached to the cut-off valve stem, which projected through the back end of the steam chest, thus enabling the engineer to change the cut-off at pleasure, within certain limits, while the engine was running. A few such engines are built today, for large saw mills, planing mills, and places where cheap fuel can be used.

About 1864 a Mr. Rider invented the "Rider" cut-off engine, which is a riding cut-off, the port for the cut-off being located on the back of the main valve. The valve is turned to fit the radius of the seat, and has a perpendicular movement controlled by the governor. The main valve has a horizontal movement controlled by the main eccentric. The effect of these opposite movements at the same time, is to change the volume of steam passing through the diagonal opening to suit the work.

In setting the valves of any steam engine whether riding cut-off or not, the same general rules should always be closely observed. First take, for example, the old plain, flat, slide valve horizontal engine as built by this Tufts before referred to in this article.

Fig. 1, represents a perpendicular section of the cylinder, steam chests and valves cutting through the main steam chest from each end as far as the expansion chest, which then shows the seat of the cut-off valve being the cover of the main valve, all the ports are clearly shown. The exhaust ports are shown in dotted lines opening on the under side to the exhaust ports, which convey the exhaust under the main valve to the exhaust port

through a passage to the centre and out of the exhaust pipe at the bottom of the cylinder. This is not a riding cut-off but immediately preceded it as previously explained.

To set the valves of this engine, place the crank on the back centre, the engine and valve gear being all connected, revolve the eccentric (being lost on the shaft) to the extreme throw at each end, mark the seat of the valve with a slight line or mark, if the lap is the same at each end, the eccentric rod and connections are the right length, if not right, make them so by altering the lengths by the screw, or putting in lines as circumstances may require, but make the laps equal. The throw of the eccentric should be the width of both steam ports and both laps of the main valves.

Place the engine on the back centre again, and if the engine is to run forward or over as it is usually termed, place the eccentric forward of the crank sufficient to give for a very slow moving engine, an opening of the valve, just discernible for medium speed, about one-sixteenth of an inch for a fast speed, with a short stroke three thirty-seconds of an inch. If the engine is to run backward or under place the eccentric back of the crank, in all cases be sure that the eccentric is advancing with the crank, also be sure when moving the engine while setting the valves, that the eccentric is properly secured.

To set the cut-off, the same method is applied to this engine as to one with a riding cut-off. Square the cut-off eccentric in the same manner as for the main eccentrics, give the cut-off valve a full port at the beginning of the stroke, note the point (as you turn the engine from one centre to the other) where the steam cuts off, if a simple valve with two ports, if the valve is the right length, and the throw of the eccentric is correct, it will cut off at both ends alike.

On a riding cut-off with a valve for each port, the adjustment will be made by altering the length of the cut-off valve stem to suit each valve, where the cut-off is not automatic, but made variable by changing the position of the valves by hand. A wheel attached to a screw with marks to designate the point of cut-off is used largely with success as applied to plain, flat cut-off riding valves.

In regard to the exhaust valve of the old style, the lap should be the right width to open at the beginning of the stroke. In all cases when the main valves of an engine are properly set, they should not be disturbed except in cases of wear in the connections where a new adjustment may be necessary.

In all cases in the setting of valves for riding cut-offs, whether automatic or not, these methods are all that are necessary to use, except in the case of a fly ball governor which should be raised its full height to determine the point of cut-off. In a shaft governor, the levers should be thrown out the full length. This last applies mostly to positive motion cut-offs. In the drop motion cut-offs, as the Corliss, Greene and some others the regulating movement is applied direct to the main valves, no separate cut-offs are used.

These rules apply to all engines that take the steam direct from the steam chest, and the ports open from the ends of the valves.

Engines that admit the steam to the ports through the valve, and exhaust at the end into the steam chest, require eccentrics and valves to move in the opposite direction, for the reason that the ports open on the inner edge, while in the other case they open on the outer edge.

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—Many complicated pieces of apparatus are proposed for mercerizing, and they are very costly. Identical effects, can, it is said, be produced with quite a simple arrangement. Anyone who possesses a continuous wide soaping machine and a stretching frame drying machine can produce goods with a silky lustre quite as good as that obtained with any of the expensive contrivances.

## Chalk Talks.

FROM BOILER TO CONDENSER.

In response to a number of inquiries we will attempt to explain in a simple and accurate manner, the course of steam from the time it leaves the boiler until it is discharged from the condenser.

Referring to the upper section of the plate, a sectional view of a steam cylinder, jet condenser, air pump and exhaust piping is shown. An arrangement which is in common use.

The high pressure steam "aa" is represented by dark shading, and the low pressure or expanded steam "bb" by lighter shading.

The steam enters the side "aa," is cut off, and expansion takes place moving the piston in the direction of the arrow to the end of the stroke. The exhaust valve now opens and the piston starts to return. The low pressure steam instead of passing direct to the atmosphere, as is the case of a high pressure engine, flows into a chamber "c," and is brought in contact with a spray of cold water. The heat being absorbed by the water, the steam is condensed and reduced in volume, thus forming a vacuum. It is, however, necessary to remove the water formed by the condensed steam together with the water admitted to condense the steam, also a small amount of air and vapor. For this purpose, a pump is required, which is called the air pump.

This arrangement is known as the jet condenser, similar to that invented by James Watt, about one hundred years ago. The valve "a" which is placed in the exhaust pipe is for the purpose of shutting off the steam from the condenser in case of accident to same. The automatic valve "e" opening under pressure allowing the steam to escape to the atmosphere and closing automatically under a vacuum.

—Keeping constantly at it is the key to successful advertising.

## Lining up an Engine.

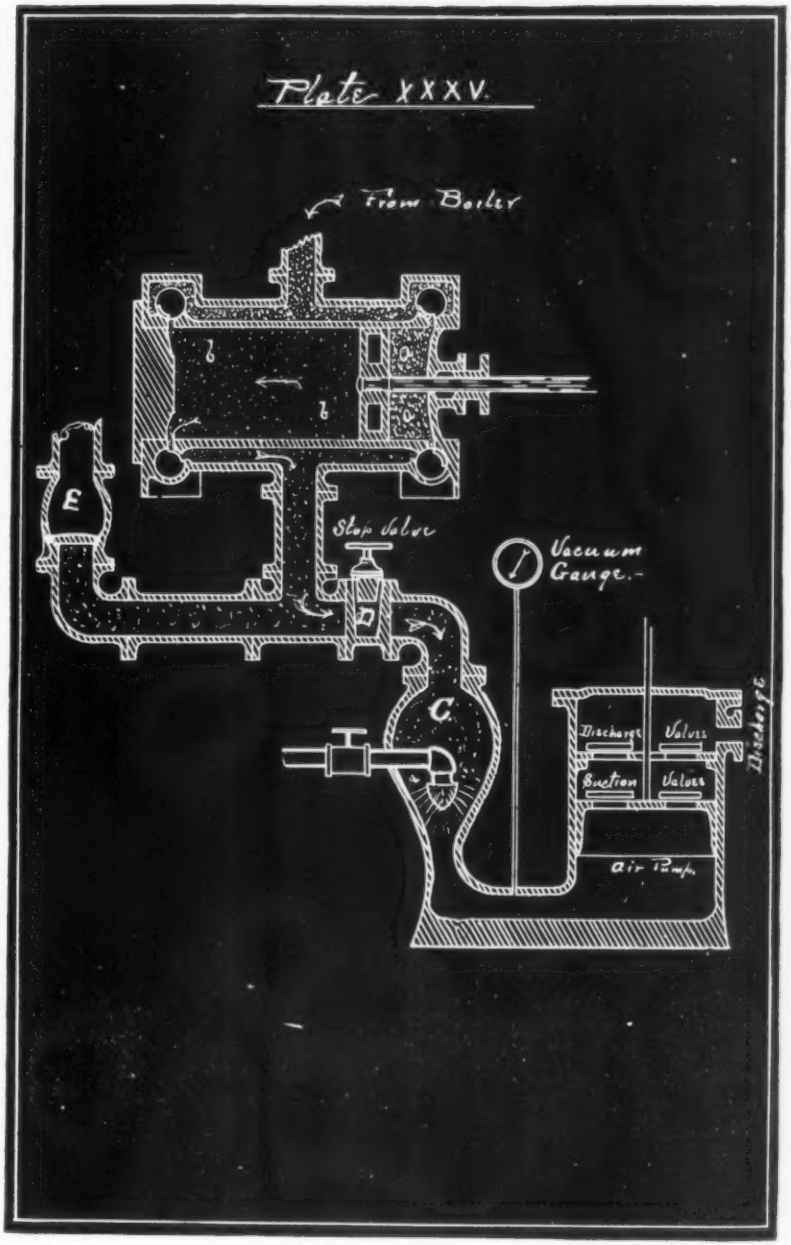
*ROBERT GRIMSHAW.*

There are few things which show the care and ability of an engineer or a machinist more than this matter of lining up. Some call to mind the old proverb that "every hair of a carpenter's head is an eighth of an inch in diameter," owing to the fact that the average carpenter will work to an eighth of an inch where almost every other mechanic would work to a hair's breadth. Others seem to appreciate the fact that a very slight variation at the cylinder end of the engine may amount to a great deal at the crank-pin.

The first thing to do is to see that the foundation is level and firm; second that the engine-bed is as nearly level as is practical to get at with the aid of levels and of sighting-strips. The bed must be leveled both lengthwise and crosswise. If it is so in these two directions it will be in every diagonal direction also. The longer the level used, the more accurate the result that can be got.

For cross-leveling, where there is not a chance to use a long level, the sighting-strips will often come in very handy. They are simply long and absolutely straight and parallel strips of wood (preferably cherry) of equal width, and used in pairs. Being laid crosswise on the engine, as on the guides, at opposite ends, as far apart as possible, and one of them being shown to be perfectly horizontal by the application of the level, the other should "sight fair" with it at both ends. A very slight twist will bring one end or the other, or both, of one of the strips, out of line with the other.

The circularity and parallelism of the cylinder-bore having been proved by a piece of stout wire, pointed at both ends, and just as long as the diameter of the bore, the cylinder may be shown to be level, if it is a horizontal engine (and we are talking now




FROM BOILER TO CONDENSER.

only of horizontal engines) by the application of the level.

The truth of the flanges may be tested by a steel square and the level; this is desirable in those cases where the guides are on a distance-piece bolted to the cylinder. The flange-faces may be plumb, yet skew horizontally with the cylinder-bore; this cannot be shown by the plumb, square or level: and either of these faults is a most serious one, which does not happen once in a hundred times but which when it is found to be the case, gives so much trouble at first and afterwards as to call for its being remedied by the builders—that is, in those cases where the guides are bolted to the flanges, or the cylinder bolted as in the Porter (so-called Tangye) pattern.

The guides may be tested for level by the level. If they are level, and if the cylinder-bore is circular, parallel and level, the guides, if level lengthwise and crosswise, will be parallel with the cylinder-axis and at right angles with the cylinder-flanges.

If the guides are higher at one end than at the other, it will be shown by the level. If they are askew, that may be shown by the sighting-strips.

To be sure that the guides are in line with the cylinder-bore there are two ways, one to be sure that they are square with the face of the flange which bolts to the cylinder and which constitutes one cylinder-head. If the cylinder-flanges are square with the bore, and the guides are square with the face of the head, then the guides will be parallel with the cylinder-bore.

Where this distance-piece construction is not followed, the guides will have to be lined with the cylinder-bore by a cord passing through the centre of the bore, being there held at the rear or "out" end by a strip wedged into the bore, and passing at the other end of the bore through a "spider" made of metal for the purpose, or of wood for the special occasion, this line being prolonged as far as possible beyond the crank.

If the shaft when laid in its bearings is higher at one end than at the other, that may usually be shown by the level, or by a plumb held against the crank-web or disk—this last, however, assuming that the crank is truly at right angles with the shaft-centre. If the shaft is no higher at one end than at the other, but is out of square with the cylinder-bore in a horizontal plane, that may be shown (assuming that the crank is at right angles with the shaft) by applying a sighting-strip horizontally to the face of the crank-web or disk, and sighting a point at a known distance from the cylinder-bore; this being determined by T-squares from the centre cord. The crank-pin will show, by being further from the centre-line when on one of the dead centres than on the other, whether or not the crank is at right angles crosswise to the cylinder-bore in the horizontal plane.

The shaft-bearings can be tested independently of the shaft, with the latter removed, by drawing a cord through their centres. The piston-head must be made exactly central with the cylinder-bore, and the cross-head made at the proper height with the latter, and also square with it and with the guides.

To recapitulate: The following are the points to which suspicion must be directed and where correction must be removed for them if they are not found correct:

Cylinder Bore:—Level.

Front Cylinder Flanges:—Plumb and at right angles with the cylinder-bore.

Guides:—Level lengthwise and crosswise; parallel with the cylinder-bore; at right angles to the cylinder-flange.

Crank:—Level; at right angles with the cylinder-bore; at the same hight with the cylinder-bore.

Piston:—Central with the cylinder-bore.

Crosshead:—Central with the cylinder-bore, at right angles throughout, and at the proper hight.

# DYEING DEPARTMENT.

## Dye Recipes for January.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

### RECIPE NO. 1.

**Orange on Cotton Yarn.**

Orange on 100 pounds cotton yarn.

Prepare dye bath with

3 lbs. Direct Orange K R.
(John J. Keller & Co., 104 Murray St., New York).
25 lbs. Common Salt.

Enter in yarn at boil, and turn one hour at that heat.

Direct Orange K R comes in the form of a dark red powder. It is very soluble in hot water, and goes on the fibre very slowly, resulting in even dyeings. (In recipes 169 and 189, November and December last, respectively, we showed shades of orange from Direct Orange K Y.)

### RECIPE NO. 2.

**Blue on Cotton and Wool Cloth.**

Alizarine Blue D R, Powder, Patented, on 100 pounds cotton and wool cloth.

Prepare dye bath with

2½ lbs. Alizarine Blue D R, Powder, Patented.
(Victor Koechl & Co., 122 Hudson St., New York.)
50 lbs. Common Salt.

Enter in cloth at boil, run 1½ hours, shut off steam and run one-half hour longer. Rinse.

Alizarine Blue D R, as well as Alizarine Blues D G and D B and D R R, is very soluble in hot water. It is also very easily applied. It does not lift on the goods too quick, but goes on slowly, which results in level dyeings. (See recipe 6, this issue, showing the effect of the D B brand.)

### RECIPE NO. 3.

**Brown on Cotton Yarn.**

Diamine Brown B on 100 pounds cotton yarn.

Prepare dye bath with

4 lbs. Diamine Brown B.
(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)
15 lbs. Glauber's Salt.
5 lbs. Soda.

Enter in yarn at boil, and turn one hour at that heat.

Diamine Brown B produces in itself a fine shade of brown, and as it will combine with other Diamine colors, a variety of shades can be dyed. (See recipe 86, June issue, 1898.)

### RECIPE NO. 4.

**Black on Cotton Yarn.**

Polyphenyl Black B on 100 pounds cotton yarn.

Prepare dye bath with

6 lbs. Polyphenyl Black B.
(John J. Keller & Co., 104 Murray St., New York.)
25 lbs. Glauber's Salt.

Enter in yarn at boil, and turn one hour at that heat. Less color and mordant are used for standing kettles.

Polyphenyl Black B will also dye cotton and wool mixed goods, producing equal shades on both fibres.

### RECIPE NO. 5.

**Tan Brown on Cotton Yarn.**

Thiocatechine on 100 lbs. cotton yarn.

Prepare dye bath with

1 lb. Thiocatechine No. 1.
1 lb. Thiocatechine No. 2.
(Sykes & Street, 85 Water St., New York.)
10 lbs. Common Salt.
5 lbs. Soda.

Enter in yarn at 140°, bring temperature up to 200°, and turn one hour at that heat. Rinse off well, and turn one-half hour in a separate bath at 140°, to which has been added

4 lbs. Sulphate of Copper.
4 lbs. Sulphuric Acid.

Rinse off. (See comments, etc., in recipe 186, December issue. See recipe 11 in this issue.)

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RECIPE NO. 6.

**Blue on Wool and Cotton Cloth**

Alizarine Blue D B on 100 pounds cotton and wool cloth.

Prepare dye bath with

2½ lbs. Alizarine Blue D B, Powder, Patented.
(Victor Koechl & Co., 122 Hudson St., New York.)
50 lbs. Common Salt.

Enter in cloth at boil, run 1½ hours, shut off steam, and run one-half hour longer. Rinse off.

Alizarine Blue D B produces a full shade of color, and like Alizarine Blue D G (see recipe 181, December issue), will dye all cotton with the addition of ammonium chloride. (See recipe No. 2, this issue, showing the effect of the D R brand.)

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RECIPE NO. 7.

**Yellow on Cotton Yarn.**

Curcumine S on 100 pounds cotton yarn.

Prepare dye bath with

2½ lbs. Curcumine S.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
20 lbs. Common Salt.
¼ lb. Sal. Soda.

Enter in yarn at boil, and turn one hour at that heat.

Curcumine S is a very soluble color in hot water. It will combine with other direct dyes for shading.

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RECIPE NO. 8.

**Blue on Worsted Yarn.**

The Amend Mordanting Process on 100 pounds worsted yarn.

(Controlled by the Amend Process Co., 205 211 Third Ave., New York.)

Prepare bath for mordanting with

6 lbs. Acetic Acid, 30%.

Turn one-half hour at 140°.

Then add to same bath a solution of

1 lb. Chromic Acid.

Turn one-half hour, and let temperature drop.

Add to bath

6 lbs. Bisulphite of Soda.

Bring temperature up to 140°, while turning, and turn one-half hour at that heat. Rinse off.

Dye in a bath of Alizarine Blue, in the regular way.

It does not take so long to mordant or dye, as according to the old way of mordanting with bichromate of potash and tartar. The yarn is left in a very much better state, as it requires no heat, to speak of, in the mordanting, thus saving steam. Also, the yarn, cloth, or stock can be handled much easier and quicker. Brighter shades are produced than if mordanted in the old way. It also saves in dyestuffs, and dyes deeper and faster colors, both to light and soaping. The dye is also assisted in working on the fibre more level.

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RECIPE NO. 9.

**Red on Worsted Yarn.**

Red on 100 pounds worsted yarn.

Prepare dye bath with

2 lbs. New Fast Red.
1 lb. Wool Red 6529.
(Hanna-Schoellkopf Co., 135 No. Water St., Philadelphia.)
10 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter in yarn at 130°, bring to boil while turning, and turn to shade at that heat.

The above combination works well, producing a brilliant shade of fast red. (See recipe 191 in the December issue.)

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RECIPE NO. 10.

**Black on Cotton Yarn.**

Direct Deep Black on 100 pounds cotton yarn.

Prepare dye bath, to start, with

7 lbs. Direct Deep Black E.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
15 lbs. Glauber's Salt.

Enter in yarn at boil, and turn one hour at that heat.

Direct Deep Black E is a very strong color, as it only takes seven per cent. to start a kettle with, and one-quarter to one-third less color for standing kettles. The shade is a very rich one,

and this dye goes on to the fibre perfectly level.

---

RECIPE NO. 11.

**Light Brown on Cotton Yarn.**

Thiocatechine on 100 pounds cotton yarn.

Prepare dye bath with

3 lbs., 5½ oz. Thiocatechine No. 1.
1 lb., 10⅔ oz. Thiocatechine No. 2.
(Sykes & Street, 85 Water St., New York.)
10 lbs. Common Salt.
10 lbs. Carbonate of Soda.

Enter in at 160°, bring up to 200°, and turn one hour at that heat. Lift out, rinse off, and develop in separate bath with

5 lbs. Sulphuric Acid.
5 lbs. Bichromate of Potash.

Enter and turn for one-half hour at 140°, then rinse off. (See comments in recipe 186, December issue, and also see recipe 5, this issue.)

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RECIPE NO. 12.

**Black on Worsted Yarn.**

Logwood Liquor for wool, on 100 lbs. worsted yarn.

Mordant at boil for 1½ hours with

3 lbs. Bichromate of Potash.
2 lbs. Tartar.

Dye in a bath of

12 lbs. Logwood Liquor for Wool
(Stamford Mfg. Co., 133 Front St., New York.)

Enter in yarn at 160°, bring to boil while turning, and turn one hour at that heat.

Logwood Liquor for Wool is a very concentrated and pure extract, which will combine well with Alizarine for blue shades, on account of the fine tone and clearness the extract produces. (See recipes 76, 83 and 108, 1898, for combinations with Alizarine.)

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RECIPE NO. 13.

**Slate on Cotton Yarn.**

Swiss Black B G on 100 pounds cotton yarn.

Prepare dye bath with

1 lb. Swiss Black B G.
(The Stone & Ware Co., 157 Maiden Lane, New York.)
10 lbs. Salt.

Enter in yarn at 160°, bring to boil while turning, and turn one hour at that heat.

By using small amouns of the Swiss Black brands, a variety of slates and drabs can be produced; and, as the shades are obtained in one operation, the cost of dyeing will come very low. (See recipe 139 in our September, last, issue, for a black.)

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RECIPE NO. 14.

**Orange on Cotton Flannel.**

Direct Orange C R R on 100 pounds cotton flannel.

Prepare dye bath with

¾ lb. Direct Orange C R R.
(A. Klipstein & Co., 122 Pearl St., New York.)
20 lbs. Common Salt.

Enter in cloth at boil, and run one hour at that heat.

For cloth, yarn or raw stock, Direct Orange C R R will be found of great service, on account of its penetrating and working slowly on the fibre.

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RECIPE NO. 15.

**Purplish Red on Cotton Yarn.**

Diazyl Garnet on 100 pounds cotton yarn.

Prepare dye bath with

3 lbs. Diazyl Garnet.
(C. Bischoff & Co., 87 Park Place, New York.)
20 lbs. Common Salt.
2½ lbs. Soda.

Enter in yarn at boil, and turn one hour at that heat.

Diazyl Garnet, as by the above dyeing, gives a fine, full shade of garnet in one dip. The color is very soluble, and dyes perfectly level on the fibre. (See recipes 183 and 190, in December issue, for brownish and purplish reds on cotton yarn, from Diazyl Brown 3 R and V.)

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RECIPE NO. 16.

**Slate on Cotton Yarn.**

Direct Black 1718 on 100 pounds cotton yarn.

Prepare dye bath with

¾ lb. Direct Black 1718.
(A. Klipstein & Co., 122 Pearl St., New York.)
15 lbs. Common Salt.

Enter in yarn at boil, and turn one hour at that heat.

Direct Black 1718, with small amounts of color, will produce a variety of pearls, drabs and slates, and with a six per cent. dyeing, a fine black is produced.

## New Dyes.

We present in this month's issue of the Dyers' Supplement, a number of very attractive colors and dyes that have not heretofore appeared in our recipes, to which we call the particular attention of manufacturers and dyers.

Wm. J. Matheson & Co., New York, have their Diamine Brown B, shown in recipe No. 3, for the production of a brown on cotton yarn. This is a direct dyeing dark brown dyestuff, a self color, which, owing to its excellent fastness to light, and great tinctorial power, is a welcome addition to the series of Diamine colors sold by this house. The shade of this particular dye has a yellow cast, which renders it very suitable for the production of a full dark brown, similar to those obtained hitherto, with a combination of cutch and logwood. It is readily soluble in hot water, whilst at a low temperature it easily precipitates. It is not recommended for dyeing either wool or silk, but for cotton it is fast to washing and light.

An excellent black on cotton yarn is to be seen in recipe No. 4, obtained from Polyphenyl Black B, sold by John J. Keller & Co., New York. This develops on the fibre very slowly, hence level dyeings will be the result. It will also dye cotton and wool piece goods, and merino yarn, uniform, and of the same depth and shade of color. It resists acid, and is therefore adapted to cross dyeing, and does not change by hot pressing. Its washing and light fastness is also very satisfactory. It may be regarded as an all round product.

The New York & Boston Dyewood Co., New York, appear in recipe No. 7, with their Curcumine S, for a yellow on cotton yarn. This is one of the regular substantive cotton colors sold by this house, and is used principally where a pure shade of yellow is desired. The properties of the substantive colors, and their use, would apply generally to this dye, which is referred to in Hurst's Dictionary of Coal-tar Colors, page 84.

We call particular attention to recipe 8 for a blue on worsted yarn, dyed according to the Amend Process, a full account of which was given in our issue of April, 1898, to which we desire to refer. We direct attention to the comments made by our dyer.

A very superior black on cotton yarn is to be seen in recipe 10, obtained from Direct Deep Black E, furnished by Farbenfabriken of Elberfeld Company, New York. This dye is called to the attention of manufacturers as a new homogenous Benzidine color, and is sold by this house in two concentrations, one of which is used in the present recipe, and the other is known as Direct Deep Black E Extra. The chief characteristics of this dye are very similar in many respects to the G brand, sold by this house, but is a little brighter in shade, and exhausts somewhat better, the latter property being of advantage when dyeing black, especially. As to the application of these dyes, it may be well to state that they are equally adapted for coloring cotton, either in the form of loose cotton, cops, hanks, or pieces, as well as for dyeing one-half wool in a neutral bath.

A. Klipstein & Company, New York, appear in recipes 14 and 16. In number 14 is to be seen an orange on cotton flannel, from Direct Orange C R R, which, as its name indicates, is a direct orange for cotton, that is fast to light, making it particularly valuable. It is also very fast to soap and chlorine. In No. 16, a slate on cotton yarn is shown, as the product of Direct Black 1718, that is intended for coloring both silk and cotton in the same bath. It is regarded as valuable as a direct dye.

C. Bischoff & Co., New York, show their Diazyl Garnet, in recipe 15, for

the production of a purplish-red on cotton yarn. The use to which this dye can be put is quite manifold, and is suitable for wool and cotton mixed goods. It will repay dyers to carefully examine the results, as shown in our Dyers' Supplement.

### The Influence of Chemistry on the Dyer's Art.

A century is nearing its end which has been well named the iron age—the generation of discoveries. It is characteristic of this cultured epoch that in all matters it is penetrated, as regards the practical questions of life, by the clear and elucidatory spirit of science, which is attractively exemplified in a recent article contributed by Dr. E. Reisse to a foreign publication, on the influence of chemistry on the dyer's art, in which he points out that new points of vantage have been always reached by means of scientific explanations and scientific analysis of what has gone before, and have enabled us to get a better idea of the secrets of nature.

All kinds of progress testify to the co-operation of science and trade in an astonishing manner, as we look back upon the achievements of the nineteenth century. There are many real triumphs celebrated by theory and practice hand in hand, and they continue to be gained. Above all, it is natural sciences—and particularly the sister sciences of chemistry and physics—that have set their mark upon the present age, and one branch of industry which chemistry has revolutionized and mightily advanced is the art of dyeing.

Till chemistry had turned its light upon dyeing it was not worthy to be called an art. There is no trade which presents greater difficulties, both in theory and practice, and which, therefore, requires deeper knowledge.

Up to the middle of the century the dyer was exclusively dependent upon the natural dyes. These had been used from remote antiquity to improve the appearance of fibres, and to satisfy the taste of men for harmonious colors. With time the range of natural colors widened, and some of them have such excellent qualities that they still enjoy the preference of many dyers. Among these logwood, redwood, madder, sandal wood, fustic, quercitron, woad, curcuma, catechu, archil, indigo, cochineal, and some others of animal, vegetable or mineral origin, still hold their ground. These dyes were used by strictly adhering to certain recipes, transmitted from one person to another, both verbally and in writing. Experience and close observation had taught under what conditions the dyeing processes were most successful, but the why and wherefore of the precautions to be taken was either known imperfectly or not at all. The dyer usually worked more or less in the dark, and his art was wholly empirical. As a material result, inexperienced hands used processes requiring all sorts of really unnecessary labor, and the art at least reached a point beyond which the knowledge in existence could not bring it. As soon, however, as chemical science acquired strength it was at once applied to dyeing, and with the wonderful results which we all know.

Results are no longer left to chance, but are based on scientific knowledge of the various coloring matters, and of the materials, such as wool, hair, feathers, leather, silk, cotton, and linen, to which they are to be applied. During the last half-century men have arisen, thanks to the propagation of works on dyeing, to the institution of research laboratories, who have been induced to devote themselves with enthusiasm to the application of chemistry to dyeing. This has happened in every European country, and they have devoted themselves to its scientific and practical application to the trade.

Thus we see dyeing becoming a branch of applied chemistry, and subjugating itself and its processes to the wide-reaching laws of that great science. But what had only begun in

the first half of this century was victoriously continued in the second. Scientific investigation of the products of the distillation of coal-tar has led to the erection of the coal-tar color making industry, a monument more enduring than bronze to those to whom it owes its existence. The first of these colors did not appear until at the end of the first half of this century, but by the happy combination of science and practice the number of these dyes has been increased in unexampled fashion during the last few decades. While the dyer was previously dependent upon the comparatively few dyestuffs furnished to him ready-made by nature, he has now an unbounded choice at his disposal. This immediately put him into a position to produce shades such as are only seen elsewhere in the productions of nature, and at the same time dyeing processes became to some extent simpler than formerly, because the accurate knowledge of their constitution which was possible in the case of the artificial dyes, enabled the best methods of using them to be worked out. Light was thrown on all dyeing processes by the exact chemical researches carried out in the laboratories which were erected in connection with all the larger dyeworks, and it became possible to regulate the methods with precision. The researches into the nature of the dyes were combined with investigations into the properties of the substances which had to be dyed, and the two kinds of work laid the foundations of the art securely.

Not a few new branches of the art owe their origin to the discovery of artificial methods of making dyes, and all others owe at least immense development to the same cause. For example the Turkey-red process was directed into entirely new channels by the discovery of artificial alizarine, and the troubles caused by having to use madder, never pure and never the same thing twice running, disappeared.

We must also remember the immense impetus given by the coal-tar colors to silk dyeing. Cotton dyeing, too, has become quite a different industry since the introduction of the substantive colors and of basic mordant dyes fast to washing. The former are the cotton dyes par excellence Everyone knows the part which acid and alizarine dyes have played in the growth of wool dyeing. Just imagine a piece dyer now without artificial coloring matters! There is no kind of textile material which has not benefited by the discovery of these bodies.

One thing remains to be noted in conclusion. The present colossal dimensions and many-sided character of the dyeing industry require corresponding qualifications on the part of its masters. Without theoretical knowledge they stand on very slippery ground and prove helpless at every turn. Chemical knowledge is now a vade-mecum for the intelligent dyer and enables him to conduct his business with success. The high position of chemistry today gives every reason for expecting that it will long continue to guide the dyer's art in the paths of progress. Much has already been done but more remains behind.

## The Noxious "Filling" of Textile Fabrics.

The board of directors of the Chamber of Commerce, Manchester, Eng., recently referred to its home trade sectional committee, complaints which had reached the chamber of the sale of certain classes of textile fabrics, used as clothing, into the finishing of which moisture-attracting materials are introduced. It was alleged that the inevitable dampness of the fabric to which these had been applied involved imminent danger to the health of the wearers. In course of the investigation made by the committee, it was stated that analyses of various textiles had been made in the testing house of the chamber, proving that noxious adulteration existed. Manufacturers had been consulted, and there was a consensus of opinion that

the materials used for this kind of filling—viz., zinc, salts, etc.—were injurious to health, and of no benefit to the cloth in the manufacture of which they were employed, beyond giving weight and "feel." There was a strong feeling amongst the numerous manufacturers consulted by the committee that the practice of employing these materials should be discontinued, and that the public ought to be warned against the purchase of goods so adulterated, since, when worn next to the skin or used as bedclothing, they become seriously dangerous to health. The committee acknowledged the necessity of using certain materials to assist in the process of manufacture and to give certain kinds of textiles a nice appearance and a soft feeling, but condemned the application of all moisture-attracting substances for this purpose likely to produce consequences destructive to comfort and health.

The following, amongst other information, was placed before the committee: —1. A waste sheeting manufacturer stated that a yard of cloth 64-in. wide, pure, weighed 15 oz., and after being "machined" or sprinkled, the same cloth weighed 18 oz. Another sample which, after machining, was specially dried, weighed 17 oz. "Sprinkling," he said, "adds from 5 per cent. to 12 per cent. additional weight."

A manufacturer of ticks and shirtings said that he used Epsom salts largely. This article gives additional weight and stiffness to the goods. The following cases were examples of the extent to which filling was used: Ticks—7 lbs. are added to the weight of a piece 80 yards in length. Shirtings—A piece weighing 13 lbs. 4 oz., pure, is filled to weigh 20 lbs. A shirting weighing 15 lbs., for the Irish market, is filled to weigh 29 lbs. Lining—A piece weighing 14 lbs. 10 ozs. is filled to weigh 19 lbs. 12 ozs.

A finisher of flannelettes stated that Epsom salts were largely used by him, and goods were additionally weighted from 12 per cent. to 25 per cent., according to the market for which the goods were required.

A flannelette and blanket manufacturer stated that in a blanket of 7 pounds weight, 1 pound additional weight was added, and also the same practice was becoming common in regard to woolen cloths, moleskins, and cords.

A number of other manufacturers and finishers had written confirming the foregoing information, and all of them condemned the practice of adulteration. A formal resolution was adopted requesting the board to take steps with a view to the suppression of the practice complained of. In pursuance of this resolution the board decided to make widely known the result of the committee's investigations, in the hope that a practice which is generally condemned not only by the chamber, but also by the good sense of merchants and manufacturers, may be effectually suppressed. Should the evil not disappear as a result of publicity, the committee will, at the request of the board, consider what other means can be adopted in order to put an end to it.

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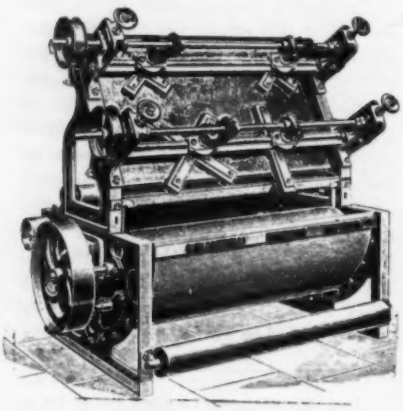
—Our English exchanges refer to a syndicate, known as The British Lustreing Syndicate, established in that country to work the mercerizing process on cotton yarn, under certain patents owned by Dr. Liebmann and Messrs. Kerr and Hoegger, of Manchester. It is reported that all of the cotton yarn firms in England and Scotland are working this process, and that arrangements have been made for its extension to Germany and the United States, the leading firms of which countries, we are informed though unauthentically, having expressed a desire to enter the syndicate.

—Before dyeing in the indigo vat, wool is very frequently dyed red by boiling with barwood, camwood, or cudbear, in which case the previous boiling in water may be omitted.

### Blanket Washer.

We illustrate, herewith, a machine for washing blankets, which has recently been placed before English manufacturers, with certain important improvements, and which may be of interest to many of our readers, enough to warrant our reference to it in this manner. We show the machine with the latest improvements, which will require but little description for one to understand its operation.

The blanket, entering the washing machine at the top, passes over a pol-



ished cast-iron scrubbing table and under a spurt pipe, which can be regulated as to supply of water by a small tap. The water flowing over the flat surface softens the coloring matters upon the blanket, which is then thoroughly cleansed by the "star cyclone" brushes. These are arranged by the action of the gear to revolve in opposite directions, thus acting not only as efficient cleansers but also as openers, thereby preventing scrimps. The machine is fitted with three small brushes on the top row, and the two larger brushes in the bottom row. By the time it has passed the star brushes, the blanket is thoroughly cleansed, and then travels through to the bottom of the machine, where it is finally cleared of all superfluous moisture by the patent drying brush, which revolves against the traverse of the blanket, removing the water from the surface. The result is that the blanket on leaving the machine is so slightly damp that three drying cylinders are more than is required to dry it thoroughly. The scrubbing brushes are open to view and easily getatable and adjusted.

### Cause of Gloss on Mercerized Yarn.

Some scientists ascribe the silky gloss obtained by mercerizing under tension partly to the rounding and stretching of the individual fibres, which are thus laid parallel to each other and are enabled to reflect the light uniformly. Great stress is laid on the destruction of the cuticula during the process of mercerizing, which is partly chemical and partly mechanical. To the absence of this cuticula is due the transparency of the fibre and to a large extent its glossy appearance. Experiments have been made in order to ascertain whether alcoholic caustic soda would produce the silky effect. Cotton steeped in a 10 per cent. solution of alcoholic soda is not affected. But if exposed to the air it gradually contracts and is mercerized. If exposed in a stretched state to the air and then washed it becomes lustrous. It is noteworthy that cotton mercerized with alcoholic soda (especially a hot solution) is stronger than that mercerized with the aqueous solution.

—The absolute purity of materials employed in the dyeing departments of our textile mills is a matter of supreme importance to manufacturers. Not only does this apply to dyestuffs alone, but to soaps, oils, mordants and all chemicals used in the scouring, washing, fulling and picking processes. To detect impurities a chemical analysis is often necessary. John S. Adriance, analytical and consulting chemist, 105 East Thirty-ninth St., New York, makes a specialty of examining mill supplies.

# QUESTIONS AND ANSWERS.

**Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.**

## Tinsel.

*Editor Textile World:*

Can you inform me where I can secure tinsel? Is it imported or made in this country?

W. M.

We do not know of any tinsel made in this country. We think it is all imported. It is made in great varieties, some 15 or 20 styles, in all colors and shades. The trade name generally used is "Lahn" for that imported from Germany. It comes put up on small spools about two inches long. We are informed that George Franke of Baltimore, imports it quite largely, and there are probably others in New York City.

## Books on Garment Dyeing.

*Editor Textile World:*

Do you know of any work on garment dyeing, or what we call job dyeing and cleansing, wet or dry? We should be greatly obliged for any information on the subject.

Maine. D. H.

We know of the following books: Hirst's Hand Book on Garment Dyeing & Cleansing. 180 pages. Illustrated. This is the most recent of any published, and price is $2. Brannt's Practical Scourer & Garment Dyer. 200 pages. Price $2. This contains chapters on dry cleansing, removing stains, washing of fine fabrics, bleaching and dyeing straw hats, dyeing garments; in fact, various branches of this business. Bird's Cleaner & Garment Dyer. 182 pages. Price was formerly $4, but lately has been reduced to $2. We can furnish any of the above at prices named.

## Silver Tipping Metal.

*Editor Textile World:*

We would like to communicate with some one who manufactures silver tipping metal or tin tipping metal. Ordinary zinc tipping metal which we use is not bright enough.

J. C.

We would suggest writing to Brooks & Company, Boston, Mass., who can furnish anything of this kind that is desired.

## Peeler and Maco Cotton.

*Editor Textile World:*

Will you kindly give me the definition of, and some information concerning, the terms "Peeler" and "Maco," as applied to cotton yarn?

Mass. H. J. H.

The origin of these terms has been given in previous issues of this magazine. That relating to maco, in the March number, 1898, page 98. "Peeler" is the name given to a long stapled cotton, grown on the rich soils of our Southern States, originating from seed that was cultivated and introduced by a planter by the name of Peeler. The term is given now rather indiscriminately to any long stapled cotton, usually to be found in the districts throughout the Mississippi Valley. "Maco" means simply Egyptian cotton, and nothing more. At one time, all Egyptian cotton was known as maco, so named after a large planter of cotton in Egypt. This term is more familiar to the cotton spinners in middle Europe, than in this country. Maco, the planter, is supposed to have been a Swiss. At one time a Frechman by the name of Jumel, did much toward the cultivation of cotton. Egyptian cotton went under the name of Maco-Jumel at one time. Egyptian cotton is commonly known in France to-day by the name of Jumel. The word "Maco" as used in this country refers more to goods of German importation made from Egyptian cotton.

## Electricity in the Carding Room.

*Editor Textile World:*

We have a good deal of trouble by electricity on our cards, at the rub rolls. It makes the roping break, so that it keeps winding around the rolls. Is there any way of getting rid of the electricity, except by some moistening device?

Michigan. B. L. N.

These inquiries come to us with frequency, of late, as will be noted in another communication of this kind, in these columns. We have answered our correspondent in a private letter, offering suggestions. We should recommend the trying of a copper wire, or rod, running in front of the rub rolls, and close to them, and placed so that the roping can come in contact with them, before

we tried anything else. The rods, or wires, can be fastened to the iron framework which supports the rub rolls, though any other attachment would answer just as well, so that there shall be communication with the ground.

## Electricity in the Card Room.

*Editor Textile World:*

We are greatly troubled with electricity in our card room, probably on account of running so many heavy belts in that department. Can you give us any advice as to how this trouble can be avoided, or, at least, minimized?

Wisconsin. C. F.

It would be somewhat working in the dark to offer any suggestion to our correspondent, without knowing all of the surrounding circumstances connected with his card room. There are various methods for preventing electricity, and we should be pleased to receive communications from practical carders, that will be helpful to our correspondent. Electricity is apt to appear in the carding room in cold, dry, or frosty weather, more than in warm or damp weather. If steam moisture could be introduced into the room, or in the locality where the trouble is experienced, it might prove helpful. The place where most trouble is apt to be experienced is in the front of the finisher card, where steam might be especially applied. The proper use of copper wire might be utilized at this locality, by allowing the roving, or roping, to run over it as it leaves the rub rolls. An emulsion of, say, nine gallons of water to one gallon of red oil and one pound of soap, mixed in a barrel, with a steam pipe connection for boiling, might prove of value, by being sprinkled on to the stock as it enters the first breaker. This, in the experience of some carders, has been found helpful, on dry days, to prevent electricity. If electricity is caused by the running of the belts, a very good arrangement is to connect the shaft bearings by a copper wire, running the latter to the lightning rod on the exterior of the building, should one be attached thereto, or to anything else that will communicate with the ground.

## No Cuts—Three in a Pin.

*Editor Textile World:*

I suppose I ought to be familiar with all mill requirements, but as I am not a practical man, I am obliged to leave matters of this kind to my agent. An order comes from him for me to purchase a number of cotton warps for the mill; and, after stating the number of ends and length desired, he writes: "No cuts—Three in a pin." Will you kindly explain to me what he means by this last expression.

Mass. G. B.

What we understand by the expression "No cuts—Three in a pin," is, first: "No cuts" means that no marks or any lease at cut length are desired; second: "Three in a pin," means that the pin lease shall be taken for three ends in the lease. The general arrangement of warping machines provides leasing-combs for two, three and four ends in a pin.

## Concrete Floor for Carding Room.

*Editor Textile World:*

We are constructing a new factory building, and desire to put our cards on the first floor, and to have this floor made of cement, or concrete. This is the English style, we understand, for carding rooms, and certainly is a good foundation, in our opinion. We desire to exclude the moisture as much as possible, and would be glad if you could give us some information on the subject.

Mich. E. R. N.

It is extremely difficult to lay down any rule without knowing the local conditions, position of the building, etc. Our correspondent does not say whether his cement floor is for the basement or to be laid at the ground level. We do not know whether it is surface drainage and dampness that must be guarded against, or whether springs and river overflow. There are a dozen different methods of providing for dry cellars of concrete. There are some preparations employed, but the latter do not seem to be held in good esteem. If the concrete is to be laid on the ground, there should be cross trenches, filled with broken stone, at frequent intervals, which should drain into the so-called French drain outside the foundation wall all around the building. This will protect you from any surface drainage. Some recommend that heavy tarred paper, covered with pitch or asphaltum, should be laid down before the concrete is put on, and that this tarred paper, with pitch covering, should be carried under the foundation wall and up the side of same on the outside and backed up by a brick course, which would prevent the dampness from getting in through the walls at the side. The thickness of the cement floor is another important factor, depending wholly upon the local conditions. If a good mason can be had, he ought to know what the local conditions demand, but if he does not know, undoubtedly some of his supply people can post him in regard to it. Instances have been called to our attention where brick courses had been laid down first in the nature of a brick sidewalk on top of the coarse broken stone, then the prepared paper with a pitch or tarred coating and then the cement built on top of that. The brick courses and insulating material were carried around under the corners and up outside the foundation in the same way.

## Printing Horse Blankets.

*Editor Textile World:*

Will you give me the address of some one who prints horse blankets?

Conn. J. W. B.

We have written to our correspondent, furnishing him with the address of a company that will do such work, but the width, weight of cloth, and pattern desired, should be given.

## Carbonizing Wool.

*Editor Textile World:*

Will you advise me as to the progress that has been made in the United States, in the manufacture of carbonized wool, and what are the principle methods employed in that manufacture?

Illinois. G. P. W.

The carbonizing of wool, or the vegetable material mixed therewith, came into use, as nearly as we can recollect at this moment, somewhere about 1875, though efforts were made in that direction during and after the war, but little was accomplished until after 1880. There are various methods of carbonizing wool, but all dependent upon the use of some acid, chiefly sulphuric, and high temperature of heat, which, acting in conjunction, accomplish the carbonization, or pulverization of the vegetable matter mixed with wool; and, if properly done, has little or no effect upon the fibre of the wool. There are two processes in use—dry and wet—one or the other being used according to the nature of the stock, the former being preferable where it is desired to have the color of the rags remain more or less untouched. There are various materials used for carbonizing, besides sulphuric and hydrochloric acids, as, for instance, a combination process of bisulphite of soda, alum and acid. We would suggest to any one not to use any process without first making himself thoroughly familiar with its manipulation.

## Benzidine and Substantive Colors.

*Editor Textile World:*

What are Benzidine and Substantive colors?

Massachusetts. G. W. H.

In order to get a correct idea and a full account of benzidine coloring matters, we would suggest that our correspondent consult George H. Hurst's Dictionary of the Coal-tar Colors, where he will find that these consist of a large number of secondary azo coloring matters, derived from benzidine and its homologues. The class of dyestuffs known as substantive colors, are sometimes classed with benzidine colors, and have recently been largely employed in calico printing, since the range of shades obtainable from these dyes has been so largely extended. Substantive colors dye cotton directly, especially in the presence of certain neutral, or slightly alkaline salts, which assist the combination of a dyestuff with a cotton fibre.

## Hosiery Bleaching.

*Editor Textile World:*

Can you give us the names of some good concerns in Baltimore and Philadelphia who do hosiery bleaching?

F. Knitting Mills.

We have answered your communication by mail.

## Cleaning Nappings.

*Editor Textile World:*

Do you know of any method, not expensive, by which the oil and oily appearance of nappings can be removed without injury to the stock?

Massachusetts. O. T.

The stock referred to by our correspondent, we understand to be cotton. We know of no method by which really satisfactory results can be effected, other than that known as the dry naphtha process, but we know of no one who operates this that would undertake the work. There are concerns that do cleansing of waste material, both cotton and wool, the names of which we have furnished our correspondent. We should not advise undertaking the work of cleansing, unless one was well equipped for it, which, of course, would involve considerable expense.

## Book on Designing.

*Editor Textile World:*

I am a practical weaver, and have also made designs for woven fabrics, mostly ornamental designs, in silk and mixed fabrics, and novelties. I would like to obtain, however, one or two text books on designing and jacquard weaving, of modern date. Can you recommend such?

Wisconsin. E. M.

We should recommend the following works: Mechanism of Weaving, by T. W. Fox, $2.50; Cotton Weaving and Designing, by John T. Taylor, $2.50; Jacquard Weaving and Designing, by T. F. Bell, $4; Ornamental Designs for Woven Fabrics, by Stephenson & Suddards, $2; Technology of Textile Design, by E. A. Posselt, $5.

## Book on Designing.

*Editor Textile World:*

Can you tell me of a good book that will furnish me instruction concerning

the changes in the weaving of such goods as plaids, checks, drills, sateens, stripes, etc.?

Alabama. C. J. M.

A very good book, we should say, for our correspondent, is one entitled "The Student's Hand-book of Practical Fabric Structure," by Henry Neville. Price $2.50. There are other excellent publications that might answer, as "Cotton Weaving and Designing," by John T. Taylor. Price $2.50. Posselt's book on "Technology of Designs," ought to be helpful. Price $5.

## Point of Cut-Off.

*Editor Textile World:*

Why do they say an engine cuts off at such a point in the stroke? What is the meaning of cut-off?

Jersey City. S. H.

Steam, like all gases, is elastic, and expands when opportunity is offered—that is, a certain volume of steam at a given pressure will expand and occupy a greater space, but at a lower pressure.

In an engine cylinder steam is admitted at boiler pressure for a part of the stroke, it is then cut off by means of the valve and mechanism operating it, and the steam expands, moving the piston forward to the end of the stroke.

The point of cut-off in a slide valve engine is the same whatever the load, and the steam pressure is varied by means of a throttling governor to conform to changes of load and drive engine at regular speed.

In Corliss and automatic cut-off engines the point of cut-off is changed with every variation in load. With less load the shorter the cut-off.

## Fire Line.

*Editor Textile World:*

Where should side walls meet the shell of a two-flue boiler? Should it be higher than top of flues, if same are below centre of boiler?

Festus, Mo. W. C. M.

The height of fire line on the shell of any boiler should be low enough so that with water at lowest point in glass the water line would be at least 4 inches above the highest fire line.

—New Jersey, Jersey City. The Standard Bookcloth Co. has been incorporated to manufacture bookcloth, shadecloth, etc. Capital, $500,000. Incorporators are Charles O. Maas, William O. Cragg and Edward E. Inhoof. Their office is in the Corporation Trust Co.'s building, Jersey City.

## New Publications.

Cotton Spinning, Volume III. by W. S. Taggart. London and New York: Macmillan & Co. Pages 436. Price $3.50. This is the third volume of a series on this subject, by a writer well known to the readers of this magazine, in which many of the illustrations have appeared. The second volume brought the subject down to the end of what is generally termed the preparing process, including the machinery and manipulation between the card and self-actor, and ring frame. This volume takes up the subject at this point, and treats of the theory of spinning, the mule, and the ring spinning frame; bobbin winding frame; doubling; yarn preparing machines; mule spinning; and humidity. Two hundred and twenty illustrations are distributed through the text. This work has developed into the most exhaustive work of the kind, for popular comprehension, that has been recently published. The various parts of the subject have been treated in such a manner that the young student may, with great benefit to himself, use it as a text book, whilst the older readers will undoubtedly find in them much of interest, in satisfying a desire for a fuller knowledge and a more perfect grasp of the principles underlying many of the processes and much of the mechanism of cotton spinning machinery. There is a great deal in the work that is original, which is of great credit to the author, when it is considered that so many have attempted to cover the same ground.

Color Cards. The Farbenfabriken of Elberfeld Company, New York, have issued two very attractive color cards, that dyers would do well to write for. One relates to the Diazotized and Developed Blues on cotton yarn, after treatment with copper sulphate, and the other to Pluto Brown R. for cotton and one-half wool. The diazotized shades that are shown are especially marked by their good appearance, the colors of which are said to be fast to washing, etc.

The Application of Benzidine Colors. This is the title of a late publication issued by the Farbenfabriken of Elberfeld Co., New York, and it is certainly a piece of art, and worthy of a place in the library of any dyer. We would suggest those interested in the several branches of printing and dyeing, writing to this house for a copy. As the title indicates, it is an exhaustive treatise in the application of the direct dyeing colors, sold by this concern, in all branches of printing, and cannot help being found of interest and service to the manufacturer. Fifteen years have now elapsed since the Benzidine colors made their appearance on the market, and at that time no one imagined the important part they would play in the improvement of many branches of the textile manufacturing industry. Although at first, their application was almost exclusively used in dyeing, it soon became apparent that they would make great headway for the requirements in printing. The Benzidine colors are suitable for padding. They can also be discharged white and colored, and with other assistance, mercerized effects can be produced, etc.

Automatic Horizontal and Upright Engines. B. F. Sturtevant & Co., Boston, Mass., have just issued their Bulletin G, relating to their generating sets with automatic horizontal and upright

engines. The catalogue is handsomely illustrated with fine half-tone cuts of these engines, in direct connection with 4-pole and 6-pole generators for electricity.

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National Bulletin of the Association of Wool Manufacturers, for December, 1898. Published by the association, 70 Kilby Street, Boston. The fourth number of Vol. 28 of this bulletin has just been received, containing articles of the usual merit, from the pen of the able secretary of the association.

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Graphite. Published by the Joseph Dixon Crucible Company, Jersey City, N. J. The first number of Vol. I. of this trade publication, or circular, is just received from the publishers. This first issue shows much literary merit, in properly placing before prospective consumers the advantages of the product of the Joseph Dixon Crucible Co., which was begun as long ago as in 1827, since which time the company has been active in promoting the use of graphite in every conceivable way. The importance of this material is universally recognized as of great value to commerce and to art.

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Diamine Colors. This is the title of a handsomely bound catalogue, with color samples, issued by Wm. J. Matheson & Co., Ltd., New York, relating to Diamine colors sold by them, as applied to satin, of silk and cotton. This catalogue is issued because of the increasing consumption of Diamine colors for this purpose, being well adapted for the object in view, as under certain conditions the colors possess the property of dyeing the cotton a deeper red than the silk.

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Immedial Black V and G. This is a trade catalogue, issued by Wm. J. Matheson & Co., Ltd., New York, that dyers should send for, as the colors referred to belong to a new group of cotton dyestuffs, possessing the property to combine directly with the vegetable fibre, giving it an intense black, which is absolutely fast to alkalies and acids, standing crabbing, and being unimpaired when passed through an acid bath.

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Calendar for 1899. The Hanna-Schoellkopf Co., Philadelphia, have issued a very attractive calendar for 1899, that can be readily placed upon the desk, or hung up. Dyers will be supplied with one of these, no doubt, upon application.

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Popular Science Monthly for January. New York: D. Appleton & Co. Price $5 per year. This month's issue contains articles of much merit. James Collier has a timely and meritorious article showing the gradual growth from the primitive nomad to the modern industrialist. An article entitled "The Mind's Eye," discusses a number of curious optical illusions, from the standpoint of the psychologist. A continuation of the series of papers on "Principles of Taxation," by the late David A. Wells, appears in this issue, to be followed by others in subsequent numbers.

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American Correspondence School of Textiles. A catalogue of 48 pages has been issued, relating to this school, by C. P. Brooks, its director. The address of the director is New Bedford, Mass., who is the managing director of the New Bedford Textile School, which will be open for students some time during 1899. This catalogue will be sent free to anyone, upon application, and contains much matter of general interest to textile people, aside from that which would naturally attract the attention of those desiring technical instruction.

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Diamine Colors. A color card upon this subject has been issued by Wm. J. Matheson & Co., 182 Front St., New York, with special reference to the application of diamine colors on woolen tissues, interwoven with mercerized cotton. Directions accompany the color samples that appear.

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Calendars for 1899. We have received calendars for the current year, handsomely gotten up, from the Insurance Company of North America, Philadelphia, Pa., and the Royal Insurance Company, of Liverpool, Eng., both represented by Field & Cowles, managers, Boston, Mass. C. J. Peters & Sons, electrotypers and typographers, 145 High St., Boston, are sending out a useful calendar to hang up, which they undoubtedly will be glad to send to anyone that would take the trouble of writing to them. Calendars have also been received from the Hartford Fire Insurance Company, Hartford, Conn., represented by Thomas W. Penhollow, 53 State St., Boston, and from the Merchants Sample Card Company, represented by Alfred S. Hatheway, 255 Centre St., New York. Lamb Knit Goods Company, Colon, Mich., manufacturers of high grade knit gloves and mittens, of silk and wool, have sent us an attractive calendar, to be hung up, giving a handsome representation of their factory, which is described as "the largest and most completely equipped plant of its kind in the world, giving employment to over 700 hands."

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Cotton Facts, by Alfred B. Shepperson. Cotton Exchange Building, New York. Price 75 cents. The 1898 edition of this well known annual by the most prominent expert in cotton statistics, in this country, has just appeared from the press. This is a compilation from official and reliable sources, of the crops, receipts, exports, stocks, home and foreign consumption, visible supply, prices and acreage of cotton for a series of years, also the reports of condition of growing cotton crops, issued by the United States Agricultural Bureau, since 1879, with complete statistics of cotton manufactures and cotton acreage and yield of each state in the South. The book gives the quantity and value of the annual exports of cotton manufactures from the United States since 1881; detailed statements of exports of cotton manufactures from United States and from Great Britain for season of 1897-98, showing the countries to which the exports were sent; authentic and interesting information respecting the cotton mills of Japan and China; statements showing cost of production of cotton; and articles in regard to the progress of improvements in the methods of baling American cotton. Of course, no cotton man would think of being without a copy of this publication.

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American Trade Index. Published by the National Association of Manufacturers, Philadelphia. This is a publication giving a descriptive and classified membership directory of the National Association of Manufacturers of the United States, arranged for the convenience of foreign buyers. This is one feature of the work that is being done by this association, in the extension of foreign trade of the country.

## Industrial News.

—The following mills have recently placed contracts with the New York Filter Manufacturing Company, 26 Cortlandt St., New York, for various types of filters: The Parkhill Mfg. Co., Fitchburg, Mass.; New York Mills, N. Y.; Titus Sheard Company, Little Falls, N. Y.

—The principal offices of the American Correspondence School of Textiles, the Lowell institution giving mail instruction in designing and other branches of textile manufacturing, have been removed to New Bedford, Mass., a branch office being retained in Lowell. Any one desiring a catalogue should address Director C. P. Brooks, New Bedford, Mass.

—The Robinson Mills, So. Windham, Me., are very busy on broadcloths and kerseys in all shades. The staff of overseers comprises Mr. Joyce, carder; J Jewett, spinner; Alexander Payler, weaver; B. Horsfall, dyer, and Mr. Shultz, finisher.

—Victor Brader, 311 East 9th St., New York City, manufacturer of hardened, tempered and tinned double steel wire heddles, is busily engaged in supplying manufacturers with his products, which are giving universal satisfaction, as far as we can learn.

—The Howard & Bullough American Machine Co., Pawtucket, R. I., have received a large repeat order for speeders and spinning frames, from the Piedmont Manufacturing Company, Piedmont, S. C.; also, a similar order for cards, drawing and speeders, together with an order for picking machinery and 3,000 spinning spindles, from the Holt-Morgan Mills, Lafayette, N. C. This company has also received an order from the Manetta Mills, Lando, S. C., for cards, drawing, speeders and part of the spinning machinery. The Granby Cotton Mills, Columbia, S. C., are now receiving from this company their additional picking machinery, consisting of openers, breaker, intermediate and finisher lappers.

—An iron bridge, with two spans of about 70 feet each, with steel floor beams and stringers, is being built by the Berlin Iron Bridge Co., East Berlin, Conn., for the town of Newport, N. Y. This company is also erecting, for the town of Whitehall, N. Y., a riveted girder bridge, having a span of 70 feet, with steel floor beams. The Waterbury Manufacturing Company, Waterbury, Conn., is having erected for them, by this company, a new blacksmith shop, two stories high, the building to be of fireproof construction throughout. The Boston & Maine R. R. Company are having erected, by this company, a building for their electric power station, at Portsmouth, N. H., the building to be 118 feet wide and 64 feet long, divided into two rooms, one for the boilers and one for the electric generators.

—In its recently issued Bulletin G, the B. F. Sturtevant Co. of Boston, Mass., illustrates and describes a unique generating set, in which both the engine and the generator are entirely enclosed, although perfectly accessible through suitable doors. Such a device is of manifest utility wherever the atmosphere is laden with dust. This bulletin, containing other information of interest, will be mailed upon application.

—The Lombard Water Wheel Governor Company, Boston, Mass., reports that the demand for their governors is constantly on the increase. During last month they received orders for upwards of twenty governors to regulate forty-one water wheels, which will develop 15,750 horse power. More than half of this machinery will be used in electric stations, principally in power transmission plants, and electric railway stations, the balance being in textile and other manufacturing plants driven by water power.

—The Farbenfabriken of Elberfeld Co., New York, have removed their Philadelphia office to 13-15 North Water St.

—L. T. LaBar, Beateyestown, N. J., is offering, at attractive prices, picker sticks from selected stock, with the best of finish, made from Jersey hickory, which has a favorable reputation wherever used.

—The textile department of the Technological School, Atlanta, Ga., has had voted to it, by the legislature, $10,000 for its special use in textile education. When the bill was before the legislature, especially in the lower house, representatives from some sections of the State opposed it, but its friends came to its defense, and the bill was passed with a good support.

—During the past few years one of the busiest machine shops in the country has been the Beattie Machine Works of Cohoes, N. Y., builders of the well known Beattie Loopers. They have built more loopers during the past two years than any ten years previously. They have also established a foreign export trade, and the Beattie loopers will be found running in Mexico, Canada, England, France, Germany, Sweden, Norway and other foreign countries. A new Corliss engine is being installed in their works which will greatly increase the efficiency of their plant.

—In its interesting and attractive circular entitled "Draft Without a Chimney," the B. F. Sturtevant Co. of Boston, Mass., tells why its tall chimney has been taken down, how draft is now produced, and how an annual fuel saving of nearly $1,000 is secured. This information may be had for the asking.

—On another page we present the advertisement of the Orianna Bleach Works, 2560 No. 3d St., Philadelphia, Pa. The business is now carried on by John F. Davidson, a careful and experienced man in his line of business. He is prepared to bleach all classes of cotton goods in the best possible manner and solicits correspondence.

—The Aerophor Company, manufacturers of the American Vortex Humidifier, have opened an office in the International Trust Building, 45 Milk St., Boston. F. B. Comins, vice-president and general manager, will make his headquarters at this office hereafter.

—A second illustrated edition of the lecture on "Mechanical Draft for Steam Boilers," delivered at Cornell University by Walter B. Snow, of the engineering staff of the B. F. Sturtevant Co., Boston, Mass., has just been issued to meet the demand for information on this important subject. Copies may be obtained upon application to the Sturtevant Co.

—The publication offices of "The American Carpet & Upholstery Journal" of Philadelphia, have just been moved to 102 S. Twelfth St. at Chestnut St. in the Beneficial Saving Fund Building. The

office of this journal is a Bureau of Information for the industries it represents and the trade generally is invited to make use of it.

—William Nelson, principal of the weaving department of the Lowell Textile School, who met with an accident some time ago, breaking his leg, has again resumed his duties at the school. His brother, Thomas, officiated for him during his absence.

—Loring, Coes & Co., Worcester, Mass., have a new "Pyro-Colcic" calendar, which is practically a reissue of the one that was in so much demand. It is in its second edition for this season, and they will be pleased to mail one to any one applying for it.

## The Hardy Incandescent Lamp.

The K. & W. Company, Pittsfield, Mass., consisting of Salem M. Hardy, W. A. Whittlesey, F. R. Whittlesey and John H. Kelman, are meeting with most satisfactory success in the manufacture and disposal of their "Hardy" incandescent lamps. This company commenced operations a little more than a year ago, and since then have been obliged to gradually increase their manufacturing facilities in order to supply the demand for their lamps. Mr. Hardy of this company was formerly with one of the largest lamp companies in New England, where he had charge of the lamp manufacture. When he took charge of this factory it was a small plant, but under his supervision its output was increased eight fold; a convincing proof of his ability as a lamp manufacturer. The filament of the lamp made by this company is composed of the purest combination of carbon known to commerce, absolutely free from all impurities, uniform in size, and of the same density throughout. The vacuum in the lamps is perfect, the exhaust pump used for this purpose being a modification of the Geissler. One of the chief reasons for the continued success and enlargement of the business of this company, is the careful selection and thorough testing that is given to their manufactures before they are allowed to leave their shops. The company already has agencies at Chicago, St. Louis, New York, Boston, San Francisco, Japan and Brazil.

## What the Link-Belt Machinery Co. Has Done the Past Year.

During the year 1898, the Link-Belt Machinery Co. of Chicago were very busy, necessitating running their plant night and day seven months and full time the balance. Representative contracts executed were for the complete power transmission machinery, link-belt elevators and conveyers installed in the new plant of the Producers' Cotton Oil Co., Yazoo City, Miss.; Hoosiac "B" Elevator, Boston, complete grain elevator machinery; Chicago Virden Coal Co., Virden, Ill., one 100 KW dynamo, engine, switchboard, and eight "Link-Belt" chain breast mining machines; McCormick Harvester Machine Co., Chicago, sand handling conveyers for their foundry; Tuscaloosa Wadding Co., Tuscaloosa, Ala., wadding elevator; Colorado Fuel & Iron Co., Sopris, Col., large coal conveyer, used in connection with their coal washer; Stineman Coal & Coke Co., South Fork, Pa., engine, 100 KW dynamo, switchboard, and 10 ton 80 h. p. locomotive; Mandell Bros., Chicago, merchandise elevator extending 8 floors; National Malleable Castings Co., Chicago., sand handling conveyers; Clearfield Coal Co., Tyler, Pa., one 150 KW dynamo, two 60 h. p. locomotives, switchboard, and 3 low "Link-Belt" mining machines; Albert Schwill Malting Co., Chicago, conveyers for handling coal into storage room and from same to boilers; Chicago City Railway Co., Chicago, coal elevator; Summit Coal Co., Linton, Ind., boiler, engine, 100 KW multipolar dynamo, switchboard and one "Link-Belt" mining machine; International Packing Co., Chicago, complete system hog conveyers; Coxe Bros. & Co., Chicago, electric coal scrapers; Consolidated Coal Co., St. Louis, one 100 KW dynamo, switchboard and one 10 ton 26 gauge locomotive; Northwestern Gas & Coke Co., Chicago, coke conveyer; University of Illinois, Champaign, Ill., coal and ashes handling machinery; Patton Coal Co., Patton, Pa., one 100 KW dynamo, engine, and 10 "Link-Belt" mining machines; Julius Knack, Detroit, Mich., retail coal pocket and conveyers; Morrisdale Coal Co., Morrisdale Mines, Pa., engine, 100 KW dynamo, 10 ton 80 h. p. locomotive; American Glucose Sugar Ref. Co., St. Paul, conveyers for handling hay; Deering Harvester Co., Chicago, sand elevators; Frankfort Chair Co., Joliet, Ill., rope drive; and Paterson & Busby, Memphis, Tenn., log haul.

## Death of George M. Endicott.

George Munroe Endicott, United States Manager of the Employers' Liability Assurance Corporation of London, died December 4, 1898, at his late residence, Canton, Mass. Mr. Endicott was a prominent figure in the insurance world in this country. He was born in New York city, where he entered the mercantile business at a very early age. Shortly before the Boston fire he had moved to that city, and his business was destroyed in the fire. He immediately started in the insurance business, in which almost from the outset he achieved distinction. Some years later he established the firm of Endicott & Macomber. This firm transacted a very large business annually in both fire and marine insurance, representing for many years as attorneys and managers the British & Foreign Marine and other prominent insurance companies.

In 1886 the firm became United States managers of the Employers' Liability Assurance Corporation of London, and entered the field hitherto untried in America, of liability insurance. In 1894, the business of the firm having risen to very important dimensions, the firm was dissolved and the business separated, Mr. Endicott becoming sole United States Manager of the Employers' Liability Company, Mr. Macomber taking the marine and fire business. Few men so stamp their individuality on a business as Mr. Endicott has impressed himself, not only on the business of his own company, but upon the entire business of liability and casualty insurance. He was not only a natural underwriter and a man of great intuitive perception, but his unswerving integrity caused his own name and that of his company to be held in respect by friends and competitors alike.

His sense of justice was extreme, and it was a principle of his business dealings that in the event of any disagreement, his adversary was to be given the benefit of every doubt. When the confer-

ence of liability managers was formed in 1896, Mr. Endicott became its chairman, which position he held at the time of his death. His friends have known that he had been suffering from an affection of the throat for many months, and have for a long time been apprehensive that he might never be able to resume his active work. His death will nevertheless be a shock to them. He leaves a widow, three daughters and a son.

## American Aniline Co.

The American Aniline Co., which was incorporated in November, 1898, has established itself at 163 North Front St., Philadelphia. While the company is a new one, its officers are well known in the trade, with a large circle of acquaintance, who will wish them success in the new organization. J. C. Dempsey, formerly manager of the Philadelphia house of the Oakes Manufacturing Co., is the president; Thomas Bromley, Jr., for 15 years secretary and treasurer of the Bromley Brothers' Carpet Co. at Philadelphia, is the secretary and treasurer, and the manager is R. B. Mills, formerly manager of the Philadelphia house of Beach & Co. The American Aniline Co. will succeed to the Philadelphia branch of Beach & Co.'s business, and are also the sole representatives for that firm for Pennsylvania, New Jersey, the South and West. As the name implies, they will handle a full and complete line of all colors, and carry a large stock on hand for immediate shipment. Besides that, they carry also a general line of extracts and chemicals. The personnel of the company is assurance that it will be conducted on energetic, broad and up-to-date lines.

## Dye Sticks.

Natural white swamp cedar has proved to be the best material for dye sticks and poles. Frank Bailey, of Cedar Brook, Camden Co., N. J., makes all his dye sticks from this wood. He has been at it a good many years, and knows the requirements of manufacturers and job dyers. Many large concerns have been using his dye sticks for a long time, and he guarantees satisfaction and solicits a trial order. He believes his prices are reasonable, and claims his goods are second to none.

## Glugloss-Gelatine.

Glugloss-Gelatine, manufactured by the Quaker City Chemical Co., Fort Wayne, Pa., is meeting with much favor among manufacturers, as a valuable substance to be used as a softener, size and filling medium, for cotton goods. It is highly spoken of for carrying clays and other weighting agents, and is regarded as an excellent substitute for albumens, gelatines, or glues, and is especially adapted, owing to its solubility, for various threads and yarns, as a finish, imparting strength and elasticity, besides developing a peculiarly lasting and desirable silk-like lustre. When used alone, or in conjunction with other pastes, such as sago, farina, starch or flour, or with tragacanth, it makes a welcome adjunct to the finishing room. It is of especial value for carpets as a glue substitute, in stiffening the carpets, or when used as a dressing for the backs of finished carpets. It imparts a most desirable "feel" and "handle" to plushes and velvets. It is highly recommended as a medium for carrying colors for printing. On the whole, it is a product that can be widely adapted in the textile trade and allied industries.

## The Novelty Dye Works.

The Novelty Dye Works, Baldwin & Ruddy proprietors, of Cincinnati, Ohio, are making a specialty of dyeing hosiery yarns and carpet chains. Both of the firm are practical men, Mr. Ruddy being formerly head dyer for the Mayesville Cotton Mills for 18 years, and for the past nine years was engaged as head dyer for Henry Pierce & Sons Co., and Pierce & Atkins of Cincinnati. Mr. Baldwin was for several years engaged as superintendent of one of the large manufacturing plants of Cincinnati. They are both of them practical men in their line and earnest and hard workers, and from their central location, they will undoubtedly command the trade of a large section of the West and South.

## The "Electric" Automatic Knitting Machine.

There has recently been an important improvement made in the "Electric" automatic knitting machine; namely, an entirely new method of transferring, by which it is claimed to be impossible to drop stitches. The change of gauge is very easily accomplished, and the yarn changer and high splicer are features of much value. During the years that the "Electric" automatic has been before the manufacturing public, there has been every opportunity to test its merits and capacity, with the large number in use, and the satisfaction which it has given in the past will be amplified by the recent new improvements. Manufacturers are invited to correspond with E. Jenckes Mfg. Co. in regard to these new features, and machines may be seen in operation at their factory, 181 Weeden St., Pawtucket, R. I., and at their Philadelphia office, 370 the Bourse.

## An Automatic Telephone.

Considerable attention is being attracted to a new automatic telephone, which is the invention of E. E. Ries. A company, to be known as the United States Automatic Telephone Co., has been formed in New York with a capital stock of $1,000,000. The principal advantages claimed for it are the cheapness of installation and economy in operation. The magneto bell battery at the subscriber's end of the circuit is done away with. The receiver of the new apparatus is a sealed chamber which may lie about on one's desk or in any convenient place. It is so weighted as to stand upright. The connections in the receiver are made through the dropping of mercury. When the receiver is upright the talking circuit is established. The current comes from a single generator in the central office. When a subscriber has rung up central, he lifts the receiver to his ear, reversing its position, when the mercury flows to another position, establishing the hearing circuit. While the subscriber is using the phone with the receiver in a reverse position, no one can cut him off, nor can he hear any other conversation. When he is through, he simply lays down the re-

ceiver. It is understood that there is plenty of money back of the new company, and it is their intention to enter the field actively at an early date.

### Factory Sites Free.

Attention is called to the advertisement of factory sites free, on another page. This property is well located, with a large frontage on the Boston & Maine Railroad, giving opportunity for spur tracks. Both the Andover and Lawrence Water Works have pipes running to the land, and the electric cars touch it at two points. It is an opportunity well worth investigation.

### Recent Sales of Mill Shares.

| | Lowest. | Highest. |
|---|---|---|
| Border City | 105 | 105 |
| Cornell | 100 | 100 |
| Sagamore | 80 | 98 |
| Stafford | 90 | 105 |
| Union | 147½ | 140 |
| Lyman | 47 | 52 |
| Pepperell | 1327½ | 1327½ |
| Amoskeag | 1455 | 1455 |
| Merrimack | 900 | 910 |
| Lawrence | 105¼ | 105¼ |
| Lancaster | 362½ | 382 |
| Naumkeag | 40¼ | 45½ |
| Chicopee | 65 | 70¼ |
| Cocheco | 160 | 161 |
| Nashua | 527½ | 540 |
| Hargreaves | 100 | 104 |
| King Philip | 90 | 100 |
| Richard Borden | 95 | 106 |
| Weetamoe | 40 | 55 |
| Manchester | 94⅞ | 95 |
| Jackson | 920 | 930 |
| York | 602½ | 621 |
| Atlantic | 39 | 43 |
| Amory | 122½ | 123⅛ |
| Otis | 1607½ | 1607½ |
| Appleton | 100 | 100 |
| American Linen | 100 | 100 |
| Pocasset | 105 | 105 |
| Davol | 100 | 100 |
| Flint | 100 | 105 |
| Granite | 90 | 91½ |
| Barnaby | 70 | 70 |
| Mechanics | 80 | 80 |
| Narragansett | 100 | 100 |
| Arlington | 100 | 100 |
| Seaconnet | 100 | 100 |
| Tecumseh | 90 | 90 |
| Troy C. & W. | 1100 | 1100 |
| Middlesex | 118 | 118 |
| Chace | 104 | 105 |
| Merchants | 75 | 75 |
| Parker | 100 | 100 |
| Franklin | 90 | 100 |
| Shove | 90 | 90 |
| Wampanoag | 92⅛ | 92½ |
| Hill | 30½ | 30½ |
| Stark | 957½ | 957½ |
| Cabot | 53 | 55 |
| Massachusetts | 82½ | 82¾ |
| Hamilton | 635 | 635 |
| Androscoggin | 110¼ | 110¼ |
| Wamsutta | 85½ | 85⅝ |
| Everett | 68¾ | 68¾ |
| Great Falls | 144 | 144 |
| Barnard | 77½ | 77½ |
| Boston | 552½ | 552½ |

# MILL NEWS.

## Cotton.

### Mills Starting Up.

—Delaware, Newcastle. It is stated that the Triton Cotton Mills, which have been idle four years, will be started up, employing about 200 hands. They will make warps for the Knowles Co., who can use nearly their entire product.

—*Georgia, Commonwealth. Machinery is being installed in the new mill of The Christian Commonwealth, which we reported recently. It is expected that 20 looms will be in operation by January 1st, on towells, denims, gray goods, etc. The following officers have been elected: President, George H. Gibson; treasurer, Dr. Hinckley; superintendent, F. J. Loiselle.

—Massachusetts, Millbury. The Farnumsville Cotton Mills have resumed operations after a four weeks' shut-down, with a force of 140 hands.

—North Carolina, Concord. The new plant of the Coleman Mfg. Co., owned and operated by negroes, was started December 24. It is equipped with 7500 spindles. Warren C. Coleman is treasurer and secretary.

—*North Carolina, Rutherfordton. The Levi Cotton Mill will start up 6000 spindles on January 1. R. H. Smith, formerly of Forest City, will be superintendent.

—*Pennsylvania, Chester. The Paterson Mills have now started up as No. 2 mill of the Chester Mfg. Co., employing 250 hands.

—Pennsylvania, Clifton Heights. It is stated that Messrs. Winterbottom, of Clifton, Pa., have leased the factory of S. Taylor & Son, at this place, known as the Modoc Mills, where they will manufacture cotton yarns, as soon as the machinery can be put into running order.

—Pennsylvania, Philadelphia. We are informed that James D. Murphy & Brother have leased the Monitor Mill at 16th and Fitzwater Streets, the property of the estate of R. Granlees. This mill has a capacity of 300 narrow looms, on shirtings and dress goods. It is expected that it will be in operation very soon.

## Woolen.

### Enlargements and Improvements.

—*Oregon, Dallas. The Pioneer Woolen Mill Company inform us that they are building a new dye house, as an addition to the plant which they recently purchased here. They manufacture blankets, flannels and fancy woolens.

They operate 20 looms, three sets of cards, steam power and dye house, employing 75 operatives. The capital stock of the company is $10,000. The head office is at Portland, Ore. A. J. Ray is president; William Walker, treasurer; F. Carter, manager and superintendent. O. H. Hayes & Co., are their selling agents. They expect to make extensive improvements in the plant.

—*Pennsylvania, Chester. The machinery which has been purchased in England for the plant of the Hitchen Manufacturing Co. has arrived, and will be placed in position as speedily as possible.

**Mills Starting Up.**

—Indiana, La Porte. The La Porte Woolen Mill, Samuel Fox's Sons, proprietors, has resumed work after a shutdown of several weeks, during which time necessary repairs were made.

—Maine, Camden. The Mount Bettie Manufacturing Conmpany's mill has again started up after a short shutdown.

—Maine, East Wilton. The Walker Mill has started up again, after a short shutdown.

—Maine, Foxcroft. Mayo & Sons' Woolen Mill, which has been running but four days a week, for a short period, is now running on full time.

—Maine, Kesar Falls. The Kesar Falls Woolen Mill is now running full time, with good prospects ahead for the winter.

—Maine, Pittsfield. The Waverley Mill, which has been running on short time, has recently received enough orders so that it has started up on full time. Walker's mill has started up with a full day force and will probably run nights also.

—*Massachusetts, Blackstone. The woolen mill, which was purchased by Chas. Fletcher, is almost thoroughly equipped, and it is expected that it will start up very soon, employing 300 hands.

—Massachusetts, Careyville. Taft, Murdock & Co.'s mill has resumed operations after a short shutdown.

—*Massachusetts, Conway. In addition to our report last week, we learn that the Delabarre Woolen Mill, at this place, will be started up about January 20, 1899, by the firm of John Fothergill & Co., of Leeds, Eng. It is a branch of the English house. Product will be overcoatings, cloakings, gaiter cloths, cap and casket cloths, dress meltons, kerseys, diagonals, doeskins, etc. This mill has eight sets of woolen cards, and 36 looms, with a dye house. It is equipped with both steam and water power, and will employ about 125 hands.

—Massachusetts, Haverhill. The carding and spinning departments at Stevens & Company's mill have started up again, after a shut down of five weeks.

—Massachusetts, Lowell. It is stated that the Faulkner Mills are about to be started up again.

—Massachusetts, Newton Lower Falls. R. T. Sullivan's mills have started up after a shutdown of two months.

—Massachusetts, Newton Lower Falls. The Silurian Mills, W. S. & F. Cordingley, proprietors, have started up.

—Massachusetts, North Bellingham. Work has been resumed at Ray's shoddy mill, after a shutdown of five weeks.

—Massachusetts, North Oxford. The mill of the Thayer Woolen Co., which has been running since December 1 on half time, will probably soon go on to full time again, as they are rushed with orders.

—*Massachusetts, Pittsfield. Helliwell & Co., the English concern, which leased the Pomeroy Mill, expect to be producing samples soon after the first of the coming year. The works will not run to their full capacity until about the first of April. Four large carding machines, of English make, have been installed, and a large amount is on the way from England.

—Massachusetts, Uxbridge. The Calumet Mill has resumed operations, and it is thought that all departments will soon be running on full time.

—Massachusetts, Uxbridge. Charles C. Capron, whose woolen mill was shut down during November, has now started up one set of cards on horse blankets.

—*Massachusetts, West Millbury. The woolen mill at this place, owned by Edwin Hoyle & Son, will probably be running in full by January first.

—New Hampshire, Hillsborough Bridge. The Hillsborough Woolen Mills have started up again after a short shutdown.

—New Hampshire, Manchester. Mill No. 1 of the Manchester Co. started work December 28. This mill has been idle since last May.

—New York, Rochester. L. L. Allen & Brother's woolen mill will start up January 2, having been closed for about four weeks.

—Pennsylvania, Chester. It is expected that the changes in the old Paterson Mill property, now occupied by the Chester Manufacturing Co., will be completed so that the plant can be started up on the 12th. The old plant of the Chester Manufacturing Co. on Caldwell St. will be started up as soon as possible after the Paterson plant.

—Rhode Island, Kenyon. It is expected that the Kenyon Woolen Mill will again be in operation in a short time.

—Rhode Island, Westerly. The Camnault Mills, which have been closed for the past two weeks, have started up to run nine hours per day.

—Wisconsin, Menasha. The Menasha Woolen Mills, owned by W. P. Hewitt & Co., which have been idle for three months, have started up again with a full force of operatives.

## Knit.

**New Mills.**

—*Georgia, Cedartown. The building known as the Wahneta Knitting Hosiery Mill is completed, and machinery is being installed. George H. Wade is superintendent.

—Georgia, Thomasville. B. F. Hawkins of this place is prospecting with the in-

tention of erecting a plant at some suitable locality for the manufacture of knit goods or cotton rope, as seems most advisable.

—Georgia, Washington. L. N. Hull, of this town, is obtaining estimates with the idea of establishing a knitting factory here.

—New York, Brooklyn. A new corporation is the Blumenthal Saxonia Worsted Mills, with the principal office at Brooklyn. Capital, $10,000, all paid in. The incorporators are S. Blumenthal, M. Drobnitzki and I. Drobnitzki, of New York. They are to manufacture knit goods.

—New York, St. Johnsville. Z. R. Klock is considering the question of starting a small stocking mill.

—New York, Utica. There is a rumor current here that Quentin McAdam may build another knitting mill for the purpose of manufacturing flat goods. If so, the mill will probably be located at West Utica.

(Continued on page 127)

# PERSONAL RECORD.

**Cotton.**

—F. H. Upham, formerly connected with the Westfield Mfg. Co., has removed to Ware.

—A. T. Verrier, formerly in charge of carding and spinning at Southbridge, Mass., has resigned his position to take the superintendency of a mill in St. Paul Park, Minn.

—F. S. Loomis has secured the position as boss weaver and overseer of weave room at Dyersville Mfg. Co.'s mill, Providence, R. I.

—Herbert M. Adams, formerly superintendent of the Adamsdale Mill, Adamsdale, Mass., has accepted a similar position offered him by the Stafford Mills, Pawtucket, R. I.

—George Barry, formerly in the carding room of H. N. Slater's mill, Webster, Mass., has been promoted to overseer of carding with the Putnam Mfg. Co., Putnam, Conn.

—A. H. Bosworth has secured the position of day watchman at the Millbury Cotton Mills, Millbury, Mass., John Young having resigned.

—C. Enos Bean, overseer of the carding department of the Berkshire Cotton Mfg. Co.'s mill, Adams, Mass., has resigned to accept a position at New Bedford, Mass.

—D. E. C. Clough, boss spinner at the Fairmont Mills, Fairmont, S. C., has taken a similar position at the Pelham Mill, Pelham, S. C.

—Henry Condon is employed in the Glendale Elastic Fabric Co.'s finishing department, Easthampton, Mass.

—B. C. Chase, Jr., third hand in the card room of the Sanford Spinning Co.'s mill, has recently taken the position of second hand of the card room of the Arkwright Mill, Fall River, Mass.

—Thomas S. Davis, chief engineer at the Lancaster Mills, Clinton, Mass., where he held a position for 25 years, has resigned. W. H. Goodwin, of New York, has taken his place.

—Paul Davignon, for the past 18 years section and second hand in the carding room of the Grosvenor Co.'s mill, Grosvenordale, Conn., has resigned.

—F. C. Dumaine has been elected treasurer of the Amory Manufacturing Co., Manchester, N. H., succeeding C. W. Amory, who has been elected treasurer of the Amoskeag Manufacturing Co., Manchester. Mr. Dumaine has been for a number of years and is still connected with the Amoskeag Co.

—James Dougherty has resigned as boss dyer for the Tucker & Cook Mfg. Co., Conway, Mass., and is now with the J. L. & T. D. Peck Mfg. Co. of Pittsfield, Mass.

—S. D. Enbanks, formerly overseer of weaving at the Statesville (N. C.) Cotton Mills, is in a similar position with the Clinton (S. C.) Cotton Mills.

—C. P. Farrell, second hand of carding at the Tremont & Suffolk Mills, Lowell, Mass., has recently taken a position as overseer of carding at the Whittendon Mills, Taunton, Mass.

—T. C. Foster is now loom fixer at the Hocomuga Mills, Greensboro, N. C., R. L. Batchelor having resigned.

—Mr. Franking, formerly of Augusta, Ga., now has charge of the spinning of the Mountain Island Cotton Mfg. Co.'s mill, Mountain Island, N. C.

—James Grant, formerly superintendent of the Warren Cotton Mills, West Warren, Mass., will take charge of the weaving when the mills start.

—Charles Gilbert of Millbury has been appointed chief engineer of the Warren Cotton Mills, West Warren, Mass.

—John W. Greenwood, overseer in the Lancaster Mills, Clinton, Mass., has resigned. His plans for the future are not made, but he now proposes to take a well earned rest. Overseer Greenwood first entered the employ of the Lancaster Mills in 1852, being employed by his father, the late James Greenwood, in the finishing department. A number of years later he removed to Saxtons River, Vt., where he had a position in a woolen mill. In 1876 he returned to Clinton and became second hand in the finishing department, and about six years ago was promoted to the position of overseer. His resignation is much regretted by the operatives under him.

—W. O. Gilbert has resigned his position with the Williamsville Mfg. Co., as

assistant master mechanic and engineer, and removed his residence to Danielson, Conn.

—Early Grover, boss weaver at the Charleston Cotton Mills, Charleston, S. C., has accepted the superintendency of the weave room at the Avondale Mill at Birmingham, Ala.

—J. E. Hector is the new overseer of carding in the Cedartown Cotton Mfg. Co.'s mill, Cedartown, Ga. Mr. Hector was formerly in a Nashville, Tenn., mill.

—L. A. Hughes, overseer of weaving at the Avondale Mill, Birmingham, Ala., has resigned on account of ill health.

—Humphrey Howarth is now second hand in the Whitman Mill's weave room, New Bedford, Mass.

—W. S. Hume is reported as having left the Hochelaga Cotton Mill, Montreal, Que., as their superintendent.

—W. C. Hall, boss carder at H. N. Slater's No. 3 mill, has resigned and gone to Belmont, N. H., where he will be employed by the Gilmanton Mills.

—Charles Hadfield has succeeded his brother, William J. Hadfield, who is now superintendent, as overseer of the carding room at the Atlantic Mills, Lawrence, Mass.

—William J. Hadfield, who has been overseer of the carding room at tte Atlantic Mills, Lawrence, Mass., has succeeded J. E. Bean as superintendent.

—A. G. James, night carder of the W. R. Kindley Cotton Mills, Mt. Pleasant, N. C., has accepted the superintendency of the Patterson Mill, Concord, N. C.

—D. R. Julian, who has been manager of the Kesler Mfg. Co.'s cotton mill since it was built, has resigned.

—Richard Key, who for the past ten years has been dyer for the Berkshire Company at Frankford, Pa., has resigned his position.

—William V. King has been elected superintendent of the Cotton Exchange in New York.

—James Lunney has filled the position left vacant by Michael T. O'Malley, second hand in the carding room of the Davol Mill, Fall River, Mass.

—George Leary, of Putnam, Conn., has succeeded Frank Manderville as boss spinner at the Farnumsville Cotton Mills, Farnumsville, Mass.

—G. A. Moody of Pawtucket, R. I., has been appointed superintendent of the Warren Cotton Mills, West Warren, Mass.

—F. D. Mosely, formerly of Gaffney, S. C., has succeeded S. D. Enbanks as overseer of weaving at the Statesville Cotton Mills, Statesville, N. C.

—C. A. Mann is the new overseer of twisting at the South Side Mfg. Co.'s mill, Salem, N. C.

—R. W. Mitcham, superintendent of the Camden (S. C.) Cotton Mills has resigned, and is now in a similar position at the Colleton Cotton Mills, Walterboro, S. C.

—J. F. Miller, recently carder at Saunders, Mass., has removed to Cohoes, N. Y.

—N. B. McCauless has been appointed superintendent of the Kestler Mill at Salisbury, N. C. D. R. Julian, formerly superintendent, has been elected to the legislature.

—W. C. McAdee, superintendent of the cloth room at the Whitney Mills, Spartanburg, S. C., has resigned.

—Michael T. O'Malley, formerly second-hand in the carding room of the Davol Mill, Fall River, Mass., has accepted a similar position in the Richard Borden Mfg. Co.'s mill, in that city.

—Paul St. Onge, loom fixer for the Paul Whitin Mfg. Co., Northbridge, Mass., has been promoted to the position of second-hand in the weave room.

—W. A. Nichols is now overseer of carding at the Laurel Lake Mill, Fall River, having resigned a like position at the Metacomet Mill.

—Walter Pollard is now in charge of the weaving department of the Lyman Mills in Holyoke. Good fancy cotton weavers will find employment at that mill, with good pay and steady work guaranteed. Mr. Pollard may be addressed.

—Mr. Page, formerly with the Amoskeag Mills, Manchester, N. H., has succeeded John W. Greenwood as overseer of the finishing department at the Lancaster Mills, Clinton, Mass.

—W. S. Pratt has taken R. Goodall's position as overseer in the No. 6 mill of the Dwight Manufacturing Co., Chicopee, Mass.

—J. R. Pierce is now superintendent of the Camden Cotton Mill, Camden, S. C. He was formerly of the Edna Mill, Reidsville, N. C.

—W. F. Ramsdell has accepted the position of boss weaver at the Warwick Mills, Centreville, R. I., R. Cowell having resigned.

—John Robinson, overseer of the cloth room of the Edna Cotton Mills, Reidsville, N. C., has resigned, and will go into the mercantile trade.

—Albert Riedel, of North Wales, Pa., has removed to New Jersey where he has accepted the superintendency of an elastic web shop.

—Robert Smith, formerly a fixer at the Barnaby Mill, Fall River, Mass., has gone to Merritton, Ont., where he has a position in a mill.

—Timothy Sullivan, overseer of carding in the Laurel Lake Mills, Fall River, Mass., has been promoted to the position of superintendent, succeeding J. H. Mason, resigned.

—Abbott E. Slade, treasurer of the Laurel Lake Mills, Fall River, Mass., has resigned. He intends engaging in the cotton business with David J. Burdick.

—J. H. Spoon has been appointed night spinner at one of the Odell Mfg. Co.'s mills, Concord, N. C.

—Louis Short, formerly loom fixer at Northbridge, Mass., is now in a similar position at Manville, R. I.

—Walter Swindles, an employee in the spinning department of the Manville

Mill, Manville, R. I., has resigned and gone to Ashton.

—Richard S. Taylor has been appointed cloth boss at the Parkmount Mills, Lenni Mills, Pa.

—E. F. Williams, formerly at the Lyman Mills, Holyoke, Mass., has accepted the position of spinning overseer with the Joslin Himalaya Co., Olneyville, R. I.

—John M. Washburn, a cotton mill boss weaver and designer, is now setting up machines for the Draper Co., Hopedale, Mass.

—William A. Wilbur has resigned as secondhand in the Durfee Mill, Fall River, Mass., and has accepted the position of overseer of carding in the Fall River Manufactory.

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**Woolen.**

—W. J. Adams, who has for some time been in charge of the finishing at Bridgewater, Vt., has resigned his position to take charge of finishing at Bound Brook, N. J.

—John Lyon, overseer of finishing in C. G. Wood & Co.'s mill, Quinapoxet, Mass., has resigned.

—W. A. Semple, son of Alexander Semple, formerly agent at Broad Brook and Norwalk, Conn., now has charge of the Albany Woolen Mills, Albany, Ore.

—A. S. Keach of Worcester has been appointed boss finisher for C. G. Wood & Co.'s satinet mill, Quinapoxet, Mass.

—Matthew Holloran has recently secured a position as secondhand in the card room of Holden, Leonard & Company's mill at Bennington, Vermont. He spent Christmas with his family, in Otter River, but intends to move them to Bennington, Vt., in the near future. He will be missed in Otter River, where he has been four years in charge of the carding in the River Mills.

—George Ault, for some time machinist in the weaving room at Newton Bros.' woolen mill, Homer, N. Y., has resigned to accept a similar position in a mill in Pennsylvania.

—Arthur Arnold, of Somerville, is now loom fixer at the Summit Woolen Co., Staffordville, Conn.

—Ivar S. Borg has resigned as dyer at the Stevens Mills, North Andover, Mass., to accept a similar position in Mechanicsville, Conn.

—F. H. F. Ballou has resigned his position as superintendent of the Conshohocken Woolen Co., W. Conshohocken, Pa.

—A. J. Buffum, formerly assistant superintendent of the Riverside Mills, Providence, R. I., has been elected superintendent of the Blackinton Mills, Blackinton, Mass.

—James Breen has secured the position of dresser tender at the Rock Mfg. Co.'s mill, Rockville, Conn.

—Mr. Brallier, of New Jersey, has been appointed assistant superintendent of the Piscataquis Woolen Mill, Guilford, Me. J. R. Pollock is superintendent.

—Wallace Bently, formerly with the Highland Worsted Mills, Camden, N. J., has been appointed superintendent of the Phoenix Mills, Philadelphia.

—John Butler, boss spinner at Holyoke for about five years, has accepted a similar position at the Chase Mill, North Oxford, Mass.

—Edward Clews of Stafford Springs, Conn., has taken a position as foreman in the spooling and dressing room at the Endrick Woolen Mills, Great Barrington, Mass.

—Albert Crabtree, formerly dyer at Leominster, Mass., has recently succeeded Mr. O'Brien as dyer at S. K. Wilson's mills, Trenton, N. J.

—James Carpenter has resigned as boss carder at the Hope Valley Woolen Company's mill, Hope Valley, R. I., to take the position of carder at the Woodville Mill.

—Alexander F. DeRycke has been employed for the past twelve years as designer with James Roy & Co., West Troy, N. Y. George A. DeRycke is assistant designer.

—L. F. Edwards, president of the Athens Woolen Mills, Athens, Ga., has resigned on account of other business needing his attention. His successor has not yet been appointed.

—Fred Haggas has resigned as superintendent of the Phoenix Mills Co.'s worsted yarn mill, Philadelphia, Pa., and Walter Bentley succeeds him.

—Joseph A. Jubb has resigned his position at Moosup, Conn., and is now in charge of the finishing for Holden, Leonard & Co., Bennington, Vt.

—Charles King has left the Aldrich Mills, Millbury, Mass., and has secured a position as carder at the mill of the Thayer Woolen Co., North Oxford, Mass.

—James D. Kelly has resigned for the present his position as finisher at the Robertsford Worsted Mills, Passaic, N. J., on account of rheumatism, and has been taken to St. Mary's Hospital. H. B. Dickinson, of George Armitage, Ltd., dyers and finishers, Bradford, Eng., has taken Mr. Kelly's place until he recovers.

—J. Levins, of Westerly, R. I., is boss weaver at the Bound Brook Woolen Mills, Bound Brook, N. J.

—J. H. Lawlor has been employed by the Collins Woolen Co., Collinsville, Mass., as finisher.

—John Leiper, for many years the superintendent of the Fitchburg Mfg. Co., Fitchburg, Mass., has accepted the superintendency of the Fitchburg Worsted Co.

—Mr. Moran, formerly a finisher at Pittsfield, Mass., has accepted a position with the Dingley Mfg. Co., Philadelphia, Pa.

—George F. Morris is loom fixer in the Devonshire Mills, Goffs Falls, N. H.

—William McGilvery of Boston has succeeded Walter Clough as bookkeeper in the Waverly Mill, Pittsfield, Me.

—Edward Magner, formerly at Norwichtown, Conn., is now dyer at the

Hope Valley Woolen Co.'s mill, Hope Valley, R. I.

—Richard Marsden, formerly in the employ of the Valley Mills, Spencer, Mass., as boss spinner, has gone to Mechanicsville, Conn.

—Armides Plourde, formerly employed in the card room of the Gonic Mfg. Co., Gonic, N. H., has removed to Franklin Falls. David Lucey has succeeded him.

—Patrick Powers of Otter River has resigned as overseer of the Lakeville Woolen Co.'s carding room, West Rutland, Mass. W. P. Brennan of Worcester has succeeded him.

—Andrew Rogers, formerly boss carder for the Hampden Woolen Company of Hampden, Mass., now has a similar positoin with the Hope Valley Woolen Company, Hope Valley, R. I.

—William Roberts, who came from Stroudsburg, Pa., to accept charge of the dyeing in the Staffordville Woolen Mill, Staffordville, Conn., has returned to Stroudsburg.

—Hugo Schultz, boss spinner for the Great Falls Woolen Co., Somersworth, N. H., has severed his connection with that firm and gone to Lisbon Falls, Me.

—Edward Senior has accepted the superintendency of the mills of the Monongahela Textile Co., Morgantown, W. Va.

—E. P. Sweeney of Keene, N. H., is now with the Cheshire Mills Company, Harrisville, N. H., as overseer of coloring.

—Thomas Spurr, formerly at Monson, Mass., as second hand, is now with the Stevens Mill, Franklin Falls, N. H., as dyer.

—P. F. Sheridan, carder for a number of years at Uxbridge, Mass., has secured a similar position with the Highland Mills, Huntington, Mass.

—Arthur Threeappleton has resigned as boss carder and spinner for the Monongahela Textile Co., Morgantown, W. Va.

—John Waterhouse, formerly at the Camnault Mill, Westerly, R. I., has secured the position of designer with the Blackinton Co., Blackinton, Mass.

—Herman P. Walter has taken a position as bookkeeper at the Washington Mills, Lawrence, Mass.

—James Woodhouse has been appointed boss carder for the Kennebec Worsted Co., Fairfield, Me.

—David Welsh, who resigned as boss finisher in the Singleton Worsted Co.'s mill to go to Providence, was presented a watch by the employees in his room.

—John Carragher has resigned as boss piper and steamfitter at the Sawyer Woolen Mills, Dover, N. H.

### Knit.

—R. W. Cooper, president, treasurer and general manager of the British Hosiery Co., Olneyville, R. I., has resigned and intends removing to New York.

—F. G. Giddings, of Amsterdam, has taken position of overseer in the Gloversville Knitting Co.'s mill, Gloversville, N. Y.

—Frank Kohler, formerly with the Glenark Mills, Woonsocket, R. I., is now boss knitter for Samuel Fitch & Sons Co., Rockville, Conn.

—Charles F. Land, formerly at Mechanicsville, N. Y., will assume the duties of superintendent at the Kavanaugh Knitting Company's mill, Waterford, N. Y.

—James Lally, formerly with the Victor Knitting Mills Co., Cohoes, N. Y., is now employed by McMichael & Wildman Mfg. Co., of Norristown, Pa.

—Joseph J. Murphy and William H. Rowe, Jr., both of Troy, have been elected directors in the Hope Mfg. Co.'s mill. Cohoes, N. Y., succeeding E. I. Goodrich and Charles Mahoney, resigned.

—Fred H. Milnes is now overseer of the carding department of A. H. & C. B. Ailing, Derby, Conn.

—Jesse Palmer, formerly of Greenwich, N. Y., is now in charge of a knitting mill at Stillwater, N. Y.

—Charles Smith, formerly with the Wright Health Underwear Co., Pownal, Vt., is now with the Harder Knitting Company, Hudson, N. Y., as spinner.

—Charles Supprise, formerly overseer of carding with E. Groat at the Hudson River Knitting Mill, Hudson, N. Y., has accepted a similar position with the Troy Knitting Mill, Troy, N. Y.

## Deaths.

—George A. Abbott of the firm of Amos Abbott & Co., Dexter, Me., died at his home December 26, in his 75th year. His father, Amos Abbott, from whom the firm was named, and Jere Abbott, came to Dexter in 1820 and began business, the former in charge of the carding mill and the later the saw mill. Mr. Abbott was a thoroughly practical manufacturer, and understood every detail of his business. Of late years the mill has been very much enlarged, and is to-day one of the finest in the state. The firm has a splendid reputation for its product, and it was Mr. Abbott's pride that it should be well deserved. He was a most charitable man and at the same time most modest and unostentatious. His gifts were always made quietly and frequently anonymously. He took great interest in the affairs of the town of Dexter, where he was born and lived all his life, and a few years since presented the town with a beautiful public library building at the cost of $30,000.

—George R. Shimer of the firm of George R. Shimer & Son, worsted yarn manufacturers of Camden, N. J., died last month at the age of 75. Mr. Shimer was born in Shimerville, Pa., and at the age of 16 became an operative in a mill in that place, of which he later became proprietor when only 23 years of age. Twice was this factory destroyed by fire, but each time rebuilt on a larger scale. In 1872 this mill was sold to his brother and he removed to Camden and for a number of years was engaged in business under the firm name of Shimer & Boyer. Several years ago this firm was dissolved, and together with his son, Charles R. Shimer, he established a new factory at

Fifth and Erie Sts. Mr. Shimer was a well-known figure in manufacturing circles in Camden and Philadelphia, and his death is mourned by a large circle of friends.

—Henry A. Rice of the firm of Denny, Rice & Co., 610 Atlantic Ave., Boston, died at his home, 13 Marlboro St., last month, at the age of 82 years. Mr. Rice became a member of the firm of Denny, Rice & Gardner in 1840. In 1855, when Mr. Gardner was elected governor of Massachusetts and retired from the firm, the name was changed to that of Denny, Rice & Co.

—Augustus R. Burpee, of Lakeport, N. H., died last month, having been in ill health for a year. Mr. Burpee was born in New Hampton in 1845, where he received his early education, and at 15 came to Lakeport and entered the employ of John Pepper, where he gained a knowledge of the hosiery business, and about eight years later went into the business for himself as a manufacturer of hosiery. In 1895 he was granted a patent on a double mitten, and has since made a specialty of manufacturing the patent double mitten and fancy knit goods.

—James Aken, president and chief stockholder of the Aken Knitting Co., Philmont, N. Y., died December 15, aged 61 years.

—James Norton, boss weaver and assistant superintendent of the Warren Woolen Co., Stafford Springs, Conn., died last month, after an illness of two weeks of typhoid fever, aged 42 years. Mr. Norton was born in Leeds, Eng., and came to this country when he was 14 years of age. He began work in a factory at Globe Village, later was in Hampden, and from there went to North Oxford, where he was overseer of weaving. He also held a similar position at Hydeville, from which place he went to Stafford Springs about eleven years ago and worked up to the position which he held at his death.

—Boaz Phillips, formerly a knit goods manufacturer, having retired from active business about seven years ago, died December 26 at his home, 4951 Wakefield St., Germantown. He was born in Leicestershire, England, in 1836, and came to America, settling in Germantown, where he established a factory on Wakefield St.

—Clinton H. Stafford, whose skull was fractured by his being thrown from his horse on Walnut Lane, died Nov. 25th, never having recovered consciousness. Mr. Stafford was junior member of the firm of James Stafford's Sons, who operate the Star Woolen Mills at Manayunk, Pa. He leaves a widow and one child.

—Walter P. Scott died very suddenly at his home in Uxbridge last month of apoplexy, in his 54th year. When he left school he entered the mill operated by his father, which is now the Elmdale, and was overseer of weaving for some time. He afterwards engaged in the shoddy business as a drummer, and later, for two years, was in business with his brother, Samuel F. Scott, in Hopedale, Conn., manufacturing satinet goods under the firm name of Scott Bros., but as this venture did not prove satisfactory, he returned to his former business as drummer and bought and sold wool and shoddy.

—Jacob E. Tritsch died last month at Logan, Ohio, aged 79 years. He was a successful manufacturer, retiring from business about three years ago, when he turned his woolen factory at Logan over to his children, who have since operated it under the firm name of Tritsch Bros.

—Martin L. Tauber of the firm of M. L. Tauber & Son, Spartanburg, Pa., is dead from the effects of a paralytic stroke.

—James Whitaker of the firm of William Whitaker & Sons., Philadelphia, Pa,. manufacturers of ticking, died December 15, at the age of 61 years.

—Paul Jagode, a well known wool merchant and a member of the firm of Jagode & Lewis, 119 Chestnut St., Philadelphia, died last month. He was returning to his home on Franklin St., at 11 P. M., when he suddenly became unconscious and died in a short time. He was born in Germany in 1839 and came to this country in 1854, obtaining work in various wool firms until 1885, when he became a member of the firm with which he was connected at the time of his death.

—John Haigh, who has been employed in the Harris Woolen Co.'s mills, Woonsocket, R. I., as a hand loom weaver for some time, died on December 10.

—Charles K. Tucker, formerly machinist in the Manchester Mills, Manchester, N. H., died recently, aged 74 years.

—J. S. Parker, a mill machinist of Willimantic, Conn., is dead.

—F. W. Langhoff, boss finisher at Lymansville, R. I., died recently.

—Peter Lee, a loom fixer in the Osborn Mills, Fall River, Mass., was struck by a train and instantly killed.

—M. J. Haverty, for the past six years second hand at the Washington Mill, Lawrence, Mass., died recently, aged 32 years.

—William Garnsey, for the past seven years engineer in the Sanford Mills, Sanford, Me., died December 11, at the age of 59 years.

—Taylor Leavitt Grant died last month aged 83 years and seven months. Mr. Grant was born in Meredith and came to Laconia in 1850, where he engaged in the wool business, and later in "putting out stockings to make," in connection with the various hosiery manufacturers in the city.

—Joseph Drach, for many years employed in the Appleton Mills and the Lowell Machine Shop, Lowell, Mass., died December 12, at the age of 87.

—Henry Carver Crowly, well known in the cloth and woolen trade in New York City, died last month, aged 48 years. Mr. Crowly was born in England and came to this country eighteen years ago.

—George Brown, a number of years overseer in the picker department of the Troy Blanket Mills, Troy, N. H., died recently at the age of 59 years.

—*Rhode Island, Thornton. Boyden & Berry, of the Vesta Knitting Company, of Providence, are now owners of the British Hosiery Mill. R. W. Cooper, founder of the British Mills, withdraws from his connection with it. The concern will continue to make hosiery, and the business of the Vesta Knitting Company will be continued at their mill in Providence.

—New York, Capron. The Capron Knitting Mill Company intend removing to Utica as soon as their new building there is completed, which will be quite a loss to this town. There is, however, a possibility that the factory at Capron will be sold or leased to some other corporation.


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**The American Dyer.**

We have a few copies of the American Dyer, by Richard H. Gibson, published in 1878. As a text book for modern methods, it is, of course, entirely out of date, but as a hand book of the old school, covering the natural dyewoods, indigo, etc., it is probably the best ever written, and no doubt many a dyer would be glad to have a copy. The books have been consigned to us by his wife, who is in most reduced circumstances. The book originally sold for $10, but the few copies remaining will be sold for $5 each, the entire proceeds of which will go to Mrs. Gibson. Address

GUILD & LORD,
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**Silk Salesman.**

A man who has a good following in the dry goods trade would like to represent the account of a manufacturer of broad silks. Can give highest references. SILK SALESMAN. Care Textile World.

**Wanted Boss Comber or Assistant.**

One who has had experience with French and German Combs on cotton or short wool. Excellent chance for advancement. Address, C. S. M., care of Textile World.

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**"This Little Belt (12 in.) was our first slack belt. It earned $640.00 in two years, in increased power, at a cost of only $63.00 for CLING-SURFACE, for the whole plant," says the superintendent of these works.**

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but is also so much more that we will send you a sample can, and guarantee that the belts will stop slipping; the power will be permanently increased; the belts can be run slack; and the leather will become as soft as calf-skin, also absolutely water-proof.

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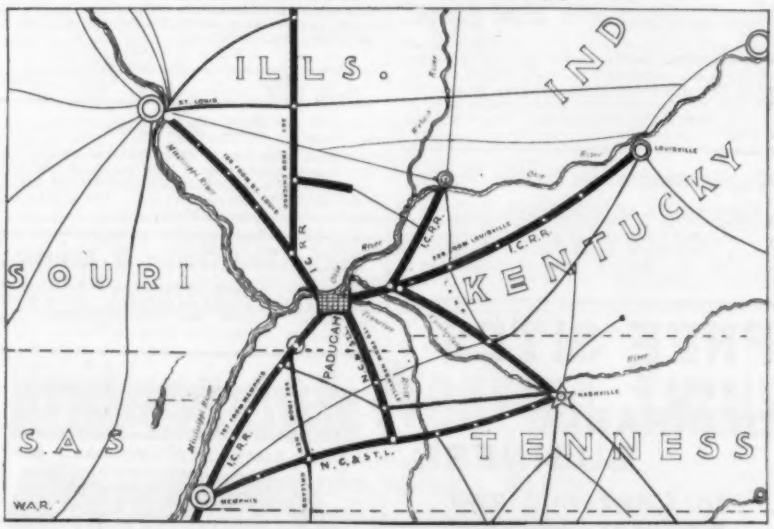


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**The Commercial and Manufacturers' Association,**
**PADUCAH, KY.**

# BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

**Automatic Feeds for Cotton and Wool.**

Woonsocket Machine & Press Co, Woonsocket, R. I.

**Balling Machine.**

Torrance Mfg. Co, 18 Davis St, E. Newark, N. J.

**Bandings.**

*See under Yarns.*

**Belting.**

Albany Belting & Supply Co., Albany, New York.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Billington, J. H. & Co., 113 Chestnut St., Philadelphia.
Boston Belting Co., 256 Devonshire St., Boston, Mass.
Fell, Geo. & Son, Bolton, England.
Link Belt Machinery Co., Chicago, Ill.
Popham, Henry, & Son, Newark, New Jersey.
*See also Mill Supplies.*

**Belt Dressing.**

Alexander Bros, 410 No. 3d St, Phila, Pa.
Cling Surface Co., 168 Virginia St., Buffalo, N. Y.

**Belt Hooks.**

Field, Frank E., New Haven, Conn.

**Bindings.**

*See Tapes and Braids.*

**Bleaching Materials.**

Roessler & Hasslacher Chemical Co, 100 William St, New York.

**Bobbins, Spools, Shuttles, Etc.**

Nashua Spool and Bobbin Co., Nashua, N.H.

**Boxes, Cloth Boards, Etc.**

Pearson, J. T, Kensington, Pa.

**Braids.**

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**Brushers.**

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**Burr Pickers.**

Curtis & Marble Machine Co., Worcester Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

**Card Clothing.**

Ashworth, Elijah, Fall Biver, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

**Calico Printers' Machinery and Supplies.**

Butterworth, H. W., Sons & Co., Philadelphia.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
*See also Dyeing, Bleaching Machinery, etc.*

**Carders' Tools.**

Brown, W. H, Mechanic St, Worcester, Mass.

**Carpet Machinery.**

Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

**Chemicals and Apparatus.**

Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Roessler & Hasslacher Chemical Co, 100 William St, New York.

**Chemist.**

Adriance, John S., 105 East 39th St., New York.

**Cloth Testing Machine.**

McKnight, S, 771 Broadway, New York.

**Combs (Wool and Cotton).**

Crabb, William, & Co, Newark, N. J.
Townsend, Thomas, 157 Orange St., Providence, R. I.

**Comber Needles.**

Townsend, Thos., Providence, R. I.

**Copper Print Rollers.**

New Bedford Copper Co, New Bedford Mass.
Phillips Co, The Thomas, Providence, R. I.
Revere Copper Co, 174 Oliver St, Boston.

**Copper Work for Dyers.**

Phillips Co, The Thomas, Providence, R. I.

**Cotton (Egyptian).**

Stoddard, Haserick, Richards & Co., Boston.

**Cotton Machinery.**

Altemus, W. W, & Son, 2816 N. 4th St, Phila. Pa.
Ashworth, Elijah, Fall River, Mass.
Cobb, Thad. S., Machinery Co., Lowell,
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Phillips Co, The Thomas, Providence, R. I.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Townsend, Thomas, 157 Orange St., Providence, R. I.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket R, I.

**Cotton Openers and Lappers.**

Howard & Bullough American Machine Co, Pawtucket, R. I.

**Cutters for Knit Fabrics.**

Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y

**Designers.**

Fresnel, Gustave, 125 W. 56th St, N. Y.

**Dextrine.**

Stein, Hirsh & Co, 165 Duane St., New York.

**Dryers.**

Philadelphia Drying Machinery Co., 6721 Germantown Ave., Philadelphia.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

**Dusters.**

*See Wool and Waste Dusters.*

**Dyers, Bleachers and Finishers.**

Brophy's, T, Sons, Jasper St, Philadelphia.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Lee Woolen Co., Springfield, Mass.
Littlewood G. J., & Sons, Manayunk, Pa.
Orianna Bleach Works, 2500 No. 2d St., Philadelphia.
Warren, W, Thread Works, Westfield, Mass.

**Dyeing, Drying, Bleaching and Finishing Machinery.**

Butterworth, H. W, & Sons Co, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Hopkins, A, & Co, Bridgeton, R. I
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln, The, Co, 54 Arch St, Hartford, Ct.
Phenix Iron Foundry, Providence, R. I.
Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.
Woonsocket Napping Machine Co, Woonsocket, R. I.

**Dye Sticks,**

Bailey, Frank, Cedar Brook, New Jersey.
Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

**Dyestuffs and Chemicals.**

Amend Process Co., 205-211 Third Ave., New York.
American Aniline Co., 138 No. Front St., Philadelphia.
Anchor Color Mfg. Co, 464 Cherry St, New York.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Cochrane Chemical Co., 50 Kilby St., Boston.
Corey, S. J, 273 Congress St, Boston
Dillon & Co, 20 Cedar St, New York.
Farbenfabriken of Elberfeld Co, 40 Stone St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Hanna-Schoellkopf Co, Philadelphia, Pa.
Innis & Co, 3 Cedar St, New York.
Jaeck Bros., The, Co., 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 122 Hudson St, N. Y.
Matheson, W. J, & Co, 182-184 Front St, N.Y.
Merrimac Chemical Co, Boston, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Pickhardt & Kuttroff, New York.
Roessler & Hasslacher Chemical Co, 100 William St, New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 133-137 Front St., N. Y.
Stone & Ware Co, The, 157 Maiden Lane N. Y.
Sykes & Street, 85 Water St, N. Y.
Thomas, N. Spencer, Elmira, New York.

**Dyers and Finishers.**

Boston Finishing Works, Williamstown Mass.
Cranston Worsted Mills (yarns), Bristol R. I.
Firth & Foster Co, Kensington, Pa.
Greenwood, R. & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I
Novelty Dye Works, Cincinnati, Ohio.
Pawtucket Dyeing & Bleaching Co, Pawtucket R. I.
Warren, W, Thread Works, Westfield, Mass.

**Edgings.**

*See Tapes, Braids and Edgings.*

**Electrotyping and Printing.**

Whitcomb, H. C, & Co, Boston.

**Elevators.**

Cohoes Foundry & Machine Co, Cohoes, N.Y.
Eastern Machinery Co, The, New Haven, Conn.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

**Engineers, Mechanical.**

Berlin Iron Bridge Co, E. Berlin, Ct.
Ferguson, John W, Paterson, N. J.

**Express Money Orders and Travelers' Cheques.**

American Express Co. offices in every city

**Fans—Exhaust and Ventilating.**

*See Ventilating Apparatus.*

**Feeders**

*See Card Feeds.*

**Feed Water Pumps.**

Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.

**Filters for Water.**

New York Filter Mfg. Co., 26 Cortlandt St., New York.

**Finishing Machinery.**

*See Dyeing, Drying, Bleaching and Finishing.*

**Fire Extinguishers.**

H. R. Bennett, 1217 Filbert St., Phila.

**Fluted Rolls.**

Cohoes Foundry & Machine Co, Cohoes, N Y
Thurston, A. G, & Son, Box 528, Fall River, Mass.

**Fulling Mills for Woolen Goods.**

Hopkins, A, & Co. Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

**Gas Engines.**

Jones, Lewis, 60½ and Media Sts, Phila, Pa.

**Gas Singeing Machines.**

Butterworth, H. W. Sons Co., Philadelphia.
Curtis & Marble Machine Co, Worcester, Ms.

**Gear Cutting Machine.**

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E, Co, New London, Conn.

**Harness Varnish.**

D. L. Witmer & Bro, 5th St. and Germantown Ave, Philadelphia.

**Heating.**

*See Ventilating.*

**Heddles.**

Brader, Victor, 311 East 9th St., New York.
Watson, L. S, Mfg. Co, Leicester, Mass.

**Hosiery Boards.**

Pearson, J. T, Kensington, Pa.

**Hose and Rubber Goods.**

Boston Belting Co., 256 Devonshire St., Boston.

**Hydro Extractors.**

American Tool & Machine Co., Boston.

**Ink, Stamping.**

Witmer, D. L, & Bro, 5th St. and Germantown Ave, Philadelphia.

**Insurance (Employers' Liability).**

Employers' Liability Assurance Co, 28 Central St, Boston, Mass.

**Knit Goods Edgings, Trimmings, etc.**

Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Friedberger & Co, Edgings, Germantown Phila, Pa.
Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.
Weimar Bros, 1817 East York St, Phila. Pa.

**Knit Goods Finishing Machines, Crochet, Etc.**

Excelsior Sewing Machine Co, 120 N. 7th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 2079 E. Cumberland St, Phila Pa.

**Knitting Machine Cylinders.**
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.

**Knitting Machinery.**
Beattie, William, Cohoes, N. Y.
Boss Knitting Machine Works, Elm and Reed Sts., Reading, Pa.
Branson Machine Co., 506 John St., Philadelphia.
Brinton, H, & Co, 213 Race St, Phila, Pa.
Campbell & Clute, Cohoes, N. Y.
Cooper, Chas, Bennington, Vt.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Manufacturing Co., Allentown, Pa.
Hepworth & Co, Lehigh Ave and Mascher St, Phila, Pa.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Lamb Mfg. Co., Chicopee Falls, Mass.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
McMichael & Wildman Mfg. Co, Norristown, Pa.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 127 Bread St, Phila, Pa.
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 2079 E. Cumberland St., Phila., Pa.
Stafford & Holt, Little Falls, N. Y.
Standard Machine Co., 508 Minor St., Philadelphia, Pa.

**Knitting Needles and Supplies.**
Breedon, Wm, & Son, Amsterdam, N. Y.
Cooper, Chas, Bennington, Vt.
Corey, Wm, Co, Manchester, N. H.
Crane Mfg. Co., Lakeport, N. H.
Dodge Needle Co., Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Lydall, H, & Foulds, Manchester, Conn.
Manufacturers' Supplies Co., 66 No. 4th St., Philadelphia.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co, Chicopee Falls, Mass.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

**Laboratory Outfits.**
Bullock & Crenshaw, 528 Arch St Phila, Pa.

**Lamps, Electric.**
Edison, Thomas A., Jr., 27 William St., New York.
K. & W., The, Company, Pittsfield, Mass.

**Looms.**
Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

**Loom Picker Manufacturers**
Crompton & Knowles Loom Works, Worcester, Mass.
Loom Picker Co, Biddeford, Me.

**Lubricators.**
Ameledema Oilless Bearing Co., Berkeley St, Wayne Junction, Philadelphia.
Dixon, Jos., Crucible Co, Jersey City, N. J
Graphite Lubricating Co, Bound Brook, N. J.

**Lumber.**
Stearns, A. T, Lumber Co, Neponset, Mass.

**Lumpers.**
Gerry, George, & Son, Athol, Mass.

**Machinery Dealers.**
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.

**Machinists' Tools.**
Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

**Mails.**
Walder, J, Paterson, N. J.

**Measuring and Folding Machines.**
Curtis & Marble Machine Co, Worcester, Ms.
Elliott & Hall, 54½ Hermon St, Worcester Mass.

**Mills For Sale.**
Denny, R. B., 143 Federal St., Boston.

**Mill Builders and Engineers.**
Berlin Iron Bridge Co, The, East Berlin, Ct
Ferguson, John W, Paterson, N. J.

**Mill Supplies.**
American Supply Co, Providence, R. I.
Bamford & Smith, Pascoag, R. I.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

**Napping Machines.**
American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Little Hustler Napping Co, Hudson, N. Y.
Woonsocket Napping Machine Co, Woonsocket, R. I.

**Novelties.**
Stohn, C, 178 Green St, Jamaica Plain Mass.

**Pantagraphs for Mill Engraving.**
Johnson, C. A, & Co, 22 Dey St, New York.

**Patterns of European Novelties.**
European Pattern Supply Co., 530 Broadway, N. Y.

**Patent Solicitors.**
Crosby & Gregory, 34 School St, Boston, Mass.
Massink, H., Amsterdam, Holland.
Phillips & Anderson, 53 State St, Boston.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

**Penstocks.**
Dalrymple, George, Fair Haven, Vt.

**Perforated Copper**
Beckley, A. J. & Co., Garwood, N. J.

**Peroxide of Sodium.**
Roessler & Hasslacher Chemical Co., 100 William St, New York.

**Picker Sticks.**
La Bar, L. T., Beateyestown, N J.
Loom Picker Co., Biddeford, Me.

**Picking, Carbonizing and Garnetting.**
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills 2025 Naudain St., Philadelphia.

**Pipe Covering (Magnesia).**
Keasby, R. A, 54 Warren St, New York.

**Pneumatic Conveying.**
*See Ventilating.*

**Power Transmitting Machinery.**
Ameledema Oilless Bearing Co, 149 West Berkley St, Wayne Junction, Pa.
Channon, H, Co, 25 Market St, Chicago, Ill.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, C. W. Company, Staten Island, N. Y.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jones, W A, 53-59 South Jefferson Street, Chicago, Ill.
Kilburn, Lincoln & Co, Fall River, Mass.
Link Belt Machinery Co, Chicago, Ill.

**Presses.**

Boomer & Boschet Press Co., 338 West Water St., Syracuse, N. Y.
Crawford, J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, C. W. Co, Staten Island, N. Y.
Phillips Co, The Thomas, Providence, R. I
Pownall, F. H, Iron Works, Jamesburg, N. J.
Sullivan Machinery Co., Claremont, N. H.
Woonsocket Machine & Press Co, Woonsocket, R. I.

**Pressing Irons, Gas and Air Heated.**

Edwards Sad Iron Co, 1420 Chestnut St., Philadelphia.
Sheftall, C. H, Mgr, 305-307 Mercer St, New York.

**Printers and Embossers.**

Novelty Textile Printing Co, 447-449 W. 14th St, New York.

**Pumps.**

Goulds Mfg. Co, Seneca Falls, N. Y.

**Reed and Harness Manufacturers.**

American Supply Co, Providence, R. I.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

**Ribbons.**

Cheney Bros, S. Manchester, Ct.

**Roller Skins.**

Fell, Geo, & Son, Bolton, England.

**Roofing, Gravel, Slag and Composition.**

Armitage Mfg. Co, Richmond, Va.
Johns, H. W., Mfg. Co., 100 William St. New York.

**Roofing, Paint and Paper.**

Armitage Mfg. Co, Richmond, Va.

**Roving Cans and Sheet Metal Work for Mills.**

Hill, Jas, Mfg. Co, Providence, R. I.
Laminar, Flore Co., No. Cambridge, Mass.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.
Sullivan Machinery Co, Claremont, N. H.

**Sample Cards.**

Merchants Sample Card Co., 79 Crosby St., New York.
Yerrington, F. M, 17 Batterymarch Street, Boston.

**Schools.**

American Correspondence School of Textiles, Lowell, Mass.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

**Sewing Machines and Supplies.**

Curtis & Marble Machine Co, Worcester, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Manufacturers' Supplies Co, 66 No. 4th St, Philadelphia.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Union Button Sewing Machine Co., 164 High St., Boston, Mass.

**Shearing Machinery.**

*See Dyeing, Drying, Bleaching and Finishing.*

**Shell Rolls.**

Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

**Shoddies.**

*See Wool Shoddies*

**Shuttles.**

*See Bobbins, Spools, Shuttles, Etc.*

**Silk Machinery.**

Butterworth, H. W. Sons Co, Philadelphia.
Crompton & Knowles Loom Works, Worcester, Mass

**Singe Plates.**

Butterworth, H. W. Sons Co., Philadelphia.
New Bedford Copper Co, New Bedford, Ms.
Revere Copper Co, 174 Oliver St., Boston.

**Sizing, Starch and Gums.**

Columbia Mfg. Co, 143-151 Pocasset St, Fall River, Mass.
Quaker City Chemical Co., Wayne Junction, Philadelphia.
Stein, Hirsch & Co, 165 Duane St, New York.

**Slashers.**

Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips Co, The Thomas, Providence, R. I.

**Soaps.**

Holbrook Manufacturing Co., New York.
India Alkali Works, Boston, Mass.

**Spindles.**

Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

**Spindle Tubes.**

Bamford & Smith, Pascoag, R. I.

**Spinning Cylinders.**

Hill, Jas. Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

**Spinning Frames.**

*See Cotton Machinery.*

**Spinning Frames for Wool**

Woonsocket Machine and Press Co., Woonsocket, R. I.

**Spinning Rings.**

Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.
Worcester Spinning Ring Co, Worcester, Mass.

**Spinning Tubes.**

Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

**Steam Boilers.**

Brown, C. H, & Co, Fitchburg, Mass.

**Steam Boiler Insurance.**

Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Mutual Boiler Insurance Co, 31 Milk St, Boston.

**Steam Engines.**

Brown, C. H, & Co, Fitchburg, Mass.
Hooven (The), Owens & Reutschler Co, Hamilton, O.

**Steam Specialties.**

Butterworth, H. W. Sons Co., Philadelphia.

**Tanks, Tubs and Vats.**

Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, 195 High St, Boston, Mass.
Corcoran, A. J, 11 John St, New York.
Cypress Lumber Co, Apalachicola, Fla.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 3240 No. 9th St, Phila, Pa

**Tapes, Braids and Edgings.**

Fleming & Chapin, 229 Church St., Phila.
Friedberger & Co, Germantown, Pa.
Goff, D. & Sons, Powtucket, R. I.
Krout & Fite Mfg. Co., Allegheny Ave. and Emerald St., Philadelphia.
Weimar Bros, 1817 East York St, Phila, Pa.
Young, Wm. M, 3638-40 Frankford Ave, Philadelphia, Pa.

**Tentering Machines.**

*See Dyeing, Bleaching Machinery, Etc.*

**Tension Pulleys.**

N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

**Testing Machines.**

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Catlin & Co, New York and Boston.
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Fleming & Chapin, Philadelphia.
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Grant Yarn Co, Fitchburg, Mass.
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Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
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Mitchell, Jas. E, & Co, Boston and Phila, Pa.
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Monument Mills, Housatonic, Mass.
Orswell Mills, Fitchburg, Mass.
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Montgomery & Co, J. R, Windsor Locks, Ct.
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Mitchell, James E, & Co, Phila. and Boston
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New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Rockwell, E. M, Leominster, Mass.
Sanford Spinning Co, Fall River, Mass.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
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Whittier Cotton Mills, Lowell, Mass.

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1465 **Superintendent or Manager** of carpet mills. 18 years' experience with large mills in all departments making carpets of all kinds. Also has been in wholesale and retail carpet business and is especially fitted for above position. Age 41, married.

1387 **Woolen Superintendent,** one who has had a thorough practical experience in setting up and operating woolen mills. Would take charge of small mill or finishing department in large mill. Now employed but wishes to change. Correspondence solicited.

1268 **Woolen** superintendent or designer. First-class experience in England and America. A first-class man in every way; age 34; married. Fancy worsteds, cheviots, novelty goods, cassimeres, overcoatings, cloakings, dress goods, piece dyes, worsteds and cheviots.

## COTTON SUPERINTENDENTS.

1464 **Superintendent of Fancy Cotton Weaving.** Age 43; married; an American. Will not work outside Northern and Eastern states. Has worked on fancy goods of all kinds, white and colored cottons, worsteds and silks. Is familiar with all makes of looms and dobby heads. Is at present employed, but wishes to better himself, if possible. Refers to present and past employers.

1453 **Superintendent** desires position in a cotton mill. Age 26; married; American. Has worked on prints, fine sateens, sheeting ginghams, duck, denims, cottonades, ticks, awnings and domets. Is familiar with all makes of spinning, spooling and warping machinery. At present employed, but wishes to obtain a more advanced position. Refers to present and past employers.

1332 **Supt. with long experience** in both Northern and Southern mills. Has started 3 Southern mills, on print cloths, broad and narrow sheetings and fine shirtings. First class references from all past positions. Age 48. Might accept position as overseer of large weave room.

1108 **Cotton Superintendent** or would accept position as overseer of large mule spinning department. Has good references and a first-class record, and is a thorough mechanic; familiar with all kinds of yarns, especial hosiery and prints; age 40 and married.

578 **Cotton Superintendent** with experience as boss carder, master mechanic and superintendent on prints, sheetings, twills and sateens. An American of high character, and whose ability is proved by past record. Age 35, married; can accept position at once.

1390 **Cotton Superintendent.** Especially qualified for a mill making dress goods and fine shirtings. Experience with first-class mills as designer and manager. A young man of high character. At present employed.

1269 **Cotton** superintendent, carder, spinner and dresser; 48; married. Has held position in some of the best mills; is strictly temperate, and well recommended. Cotton, flannels, ginghams, crochet and Marseilles quilts, etc.

1236 **Supt. of Cotton Mill** desires to change position. Is thoroughly competent, steady and reliable. Good mechanic, manager, rush and executive ability. Over 15 years experience, and fully understands how to keep production right as to quantity, quality, and lowest cost. Best system of economy maintained. First-class references can be given.

## WOOLEN CARDERS.

1475 **Wool Carder and Spinner.** Out of work because his mill shut down. An excellent carder and spinner, highly recommended. Prefers the West. Will start at moderate salary.

1470 **Boss Woolen Carder.** Experience on great variety of goods: cassimere, beaver, asbestos, wool, cotton and shoddy mixes, also in knitting mill. Well recommended. Age 31, married

1180 Wants position as 2nd hand of carding in woolen or knit mill. Age 23; single. Has been successful in like position. Prefers position in Mass., R. I., Conn., N. H., Penn., N. Y. or N. J. References if required.

1314 **Woolen Carder.** American. Age 30. Married. At present employed. Experience on beavers, cassimeres, cheviots, dress goods. Well spoken of by former employers. A first class man for a small mill.

1358 **Wool Carder**, now employed as second hand in large mill. Highly spoken of by past employers, habits, character and ability A1. Capable of taking charge of a room. Experience on high and low grade stock. Age 27, American, married.

1357 **Woolen Carder** now employed in satinet mill, has had 11 years' experience on fine goods and wishes to get back to that work; qualified to take a first class job. Age 39, English, married.

1248 **Carder,** woolen. Age 37 years; married. 10 years with one of the best mills in New England. Dress goods, beavers, blankets, cotton warp hair lines and kerseys.

1378 **Overseer Woolen Carding.** American, age 32, married. With one mill 13 years, and another 4 years. Excellent references from each. A first-class carder in every way.

## COTTON CARDERS.

1432 **Overseer Cotton Carding.** This man has worked up from sweeping boy to overseer in the same mill and we have a letter from the former manager expressing the highest regard for his ability and character. Age 30, Married.

423 **Cotton Carder or Supt.** At present in the South but desires to return to the North. Early training and most of his experience was in N. E. mills. Understands combing. Age 38. Married

1368 **Overseer on Second-Hand Cotton** Carding wants a position in small room at $2.50 per day or upwards. Will do his own grinding. Or, would take a first-class second hand job. Last five years in one place. Thoroughly practical and understands all the machinery in the card room. Age 37; married. Good reference. Prefers New England.

1238 **Second** hand of cotton carding. 37; married. Open for engagement.

1403 **Cotton Carder** with 17 years experience in N. E. mills as overseer and second-hand, now in the South but wants to return North. Has never worked for less than $3.00 but would take $2.50 to change. Married. Age 38. Best of references.

1469 **Cotton Carder and Spinner.** Has had charge of both in good mills. Excellent references. Age 37, married.

## WOOLEN SPINNERS.

1461 **Spinner, on Cotton or Wool.** Age 33; married; French. Has worked in one of the best thread works in this country, also in Alsace-Lorraine, on yarns from 70s to 160s. Is familiar with Dobson & Barlow machines and Schlumberger mules.

1299 Woolen Spinner who has had experience as second-hand would like a position as boss spinner. Would accept small salary to start. Has worked on cloakings, dress goods and Scotch tweeds in New England mill.

1276 **Spinner,** woolen. Wool and shoddy from 1-2 to 10 run, cassimeres, flannels, dress goods, underwear and blankets. Davis & Furber, Furbush & Sons, Johnson & Basset, and Schmidt machinery. Good references.

633 **Woolen Mule Spinner** desires to move from Maine on account of wife's health. At present in good position. Age 37; married, Scotchman.

## COTTON SPINNERS.

1424 **Overseer, Spinning.** Mules preferred. At present employed in N. B. mill. Has held position as overseer 6 years. Single. Will go anywhere.

1407 **Cotton Frame Spinner** now in charge of nearly 30,000 spindles in a Southern mill wants to return north. First-class reference both north and south where he has worked. Age 30. Married. American.

1438 **Cotton Mule Spinner** who has worked on plain white goods only desires to secure a permanent position in the Eastern or Central states. Has good references and is perfectly reliable. Age 45. Married.

1429 **Cotton Ring Spinner** who has been overseer 5 years and second hand 8 years. Worked on white and colored yarns, spooled and twisted. Refers to past employers in Maine and Mass. Age 36. Married.

1471 **Overseer Ring Spinning,** spooling, warping, twisting. 13 years' experience in England and 6 years in this country. White and colored yarns from 5s to 90s. Refers to past employers. Age 38, married.

1187 **Overseer of Dressing** or spinning wants a position in a cotton mill. Is an A1 man on colored or white goods, and understands slashing and beaming thoroughly. American; age 38; married. Has had charge in some of the best mills of New England. Sheetings, shirtings, dress goods, cheviots, flannels and sateens. Familiar with Mason, Whitin and Lowell machinery.

1280 **Wanted, situation** as overseer or second hand of mule spinning by a thorough, practical man. Good references from past and present employers. Understands all English makes of mules. Will go South or Canada.

1158 **Overseer of Ring Spinning,** spooling, warping and slashing wants position on white work, fine or coarse. Age 46; single. Will go anywhere. Good references. Familiar with Mason, Bedford, Lowell and Fales & Jencks machinery.

## WOOLEN WEAVERS.

1433 **Overseer Woolen Weaving.** More than 18 years' experience in large mills in Canada and the States. He is highly recommended for position of boss weaver or assistant superintendent. Experience covers a large variety of cloths on Crompton & Knowles looms. Age 36. Married.

1434 **Boss Weaver, Woolens.** Wants a job in a large mill and can handle same in good shape. Age 36. Married. Has made fancy worsteds, fancy cassimeres, meltons, dress goods, etc.

1340 **Worsted Weaver** would like position in a small mill at moderate salary; experience as fixer and in cloth room. Age 38, married. Knowles and Crompton looms; references good.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 36; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels. Will not go South, West or Pennsylvania.

1468 **First-Class Weaver** on fancy woolens, worsteds and meltons, cotton worsteds and shoddy goods. Can take overseer position after 6 days' notice. Has been loom fixer, boss and superintendent. Age 43. Crompton & Knowles looms.

## COTTON WEAVERS.

1463 **Overseer** of Cotton or Woolen Weave Room, or overseer and designer in small weaving room. Age 40; married; English. Has worked on plain and fancy cottons, cotton flannels, suitings, twills, velveteens, corduroys, etc., and a great variety of woolen and worsted goods. Is familiar with all makes of English and American machinery, cotton looms, plain and fancy; Knowles & Crompton woolen looms. Is not at present employed and can take a position immediately. Good references.

1459 **Fancy Cotton Weaving,** Slashing, etc. Age 36; married. Has worked on all kinds of fancy goods and is thoroughly competent in all departments of manufacturing, with the exception of spinning. Understands velvet and corduroy weaving. Is not at present employed and can take a position immediately.

1425 **Overseer, Cotton Weaving** Age 38. Married. At present employed in large Mass. mill where he has been for 7 years as overseer. Worked on all kinds of goods and is well experienced. American. Refers to past and present employers.

1380 **Overseer Cotton Weaving.** Held overseer's position for 5 years in Mass. mill, but now out because of change in management. A man of well-known ability. Age 48; married, American. One of the best weavers in New England. Will go South to a good position.

1334 **Jacquard and Dobby Weaver** and designer on Knowles machines. 8 years' experience in this position. At present employed and can furnish excellent references. Age 38; married.

1333 **Overseer of Cotton Weaving** with more than 20 years' experience in weave rooms of N. E. and Canadian mills. Experience on all kinds of white and colored, plain and fancy work, except Jacquard, American and English, looms. Married; age 37.

## DYERS.

1457 **Dyer.** Age 26; has worked on yarns, pieces, raw stock, indigo vats and cotton yarn. Is at present employed, but can take a position on short notice. Refers to past and present employers.

1467 **Cotton or Worsted Dyer.** Large experience as second hand and boss. At present employed but desires change for good reasons. Would start at $2 50 a day.

1460 **Boss Dyer.** Age 32; married; English. Will take a position in any of the Northern states, but prefers the vicinity of Philadelphia, if possible. Is at present employed, but can take a position after Jan. 1st. Has worked on cotton yarns, braids, cotton piece goods, hosiery, raw cotton and worsted yarns. Is familiar with Pierce & Bray cotton yarn dyeing machines, jigs and ordinary piece kettle machines.

180 **Woolen Dyer.** Age 42; married. Has had a large experience, and is a good practical man. Used to all classes of goods. Has worked largely on government orders. Good indigo dyer. Refers to former employers and others.

1442 **Boss Dyer.** Age 30 years; married. Has worked on all kinds of goods except cotton. Has excellent references. Refers to former employers and others

1440 **Dyer.** Age 50; married, American. Has been in first-class mills and refers to them. Has worked on raw stock, wool, shoddy, and cotton, also piece dyes.

1426 **Dyer,** silk or cotton. Age 45. Married. Italian. Learned trade in France Has worked 21 years in this country in good mill Refers to past employers.

1476 **Boss Dyer.** Experience on kerseys, broadcloths, dress goods, cassimeres and worsted piece dyes. Has been in good mills for 3. 5 and 7 years and gave satisfaction. Would start in New England or Central States for $3.00 a day.

1477 **Cotton Dyer and Finisher** of unusually wide experience in first-class New England mills. Highly recommended. A valuable man for above position. Age 35, married, American.

1278 **Wool Dyer.** Very successful and reliable and has had large experience. Practical indigo dyer. Can accept position at once. Best of references

## FINISHERS.

1428 **Overseer of Napping.** Young man just out of position because his mill stopped making fleece lined underwear. Experience on French machines and Davis & Furber cloth and knit nappers. Can refer to leading Mass. mill men for whom he has worked. Will go West. Single.

1214 **Woolen and Worsted Finisher.** A first class man. One that has had a thorough experience in one of the best mills in New England.

1437 **Finisher** wants to change present job for one paying $2.50 or more. Has had a wide experience for a young man. Has worked on many kinds of machines and has good references. Single. Age 30.

1351 **Woolen and Worsted Finisher** with 7 years' experience as overseer in R. I. and N. Y. mills, from which he has excellent references. At present second hand in one of the best worsted mills in N. E. Habits first-class; age 29, married

## KNITTERS.

1455 **Superintendent, Boss Knitter** or Sewing Machine Fixer. Age 32; married. Not at present employed and could take a position at once. Has worked on balbriggans, together with all kinds of ribbed goods and flat work. Is familiar with the leading makes of knitting machines and all kinds of sewing machines. Good references.

1450 **Foreman or Superintendent of Hosiery.** Age 40; married. Has worked on cut feet, seamless half hose, ladies' and children's hosiery. Is familiar with every standard make of knitting and sewing machines. Is first-class finisher, and can start new plant. Salary moderate. Prefers to go South, if possible. Refers to former and present employers.

1441 **Supt. or Overseer in Hosiery** Mill. Age 49; married. Wishes to obtain a position near Boston. Cannot take a position before January 1st, 1899. Has worked on all classes of knit goods and is familiar with all the leading makes of machinery. Refers to past employers.

1405 **Boss Knitter.** Young man with good knowledge of knit goods. A1 on circular ribbers. Thoroughly experienced on mittens, leggings and golf hose. owns 3 machines. Can bring best of references from large concerns. Desires position with good house.

1224 **Boss Knitter.** At present employed, but wants to change. 15 years' experience on ribbed underwear; all kinds of ribbed machines and sewing machines. Strictly temperate. Good references.

1472 **Knitting Mill Superintendent** who has had 11 years' experience as superintendent and machinist. Has practical knowledge of the manufacture of all kinds of knit goods. References from past employers. Age 46, married.

## DESIGNERS.

1444 **Designer.** Has made a special study of designing during the past ten years. Wants a position which offers chance for advancement. Has worked on all classes of goods and is familiar with standard makes of machinery. Can fix, set up and has started sections of new fancy looms.

1445 **Designer or Finisher**, or will take position as supt. of a small mill. German, protestant, age 36, married. Has worked in several New England mills and refers to them. Graduate of the Werden Textile school, Saxony. Has worked on kerseys, beavers, cassimeres, cheviots, etc. Is familiar with all makes of American and German machinery.

1447 **Assistant Supt. or Designer.** American. A graduate of Philadelphia Textile school and has worked in Philadelphia and Massachusetts mills. Wishes to obtain a position in Philadelphia or vicinity. Has worked on cotton shirtings, woolen and worsted dress goods and men's wear. Is familiar with all American makes of machinery. Can give good references.

1449 **Overseer of Weaving or Designer.** Age 38; married; American. Thoroughly capable. Has designed his own goods for eight years, and studied designing for two years. Left last position on account of sickness, and will take a small salary to start. Has worked on all classes of cottons, plain and fancy, and is acquainted with all makes of machinery. Refers to former employers and others.

## MISCELLANEOUS.

1474 **Designer** on novelty dress goods, cassimeres, blanket cloths, coverts. Philadelphia Textile School graduate and 3 years in first-class Massachusetts mill. At present out of work by shut down of mill.

1478 **Overseer Beaming, Slashing,** warping, quilling, wants position in mill making fine goods. Large experience on ginghams, shirtings, linings and fancy novelties. Well recommended by well known mills. Age 39, married.

1462 **Colorist, Chemist,** or Assistant in Print Works. Age 25; single; American. Acquainted with the printing of silkolines, sateens, cretonnes, dress goods, etc., and has a good knowledge of special processes. Is familiar with all machines used in bleaching, dyeing, printing and finishing. Is a graduate of the M. I. T. in Chemical Engineering.

1456 **Engineer.** Age 32; married; American. Wishes to obtain work in New England. Is not at present employed and can take a position at once. Is familiar with Corliss and high speed engines; can do his own indicating and adjusting and is a practical electrician.

1473 **Overseer Steam Gigging and** Boiling. Has worked for many years in large mills. Would accept $2.50 a day at start. Age 33, married.

1466 **Overseer of Dressing.** Experience on worsted cassimeres, dress goods, flannels. Good references, temperate, age 32, married.

1451 **Mechanic or Chief Engineer.** Age 37; married; American. A first-class mechanic and engineer. At present employed, but wishes to obtain a position where there is a better chance for advancement. Has been 2½ years in present position as master mechanic, and was previously for 13 years with one firm as department foreman, engineer and master mechanic. Refers to former and present employers.

1448 **Cashier or Bookkeeper.** Age 26; American, single. Is a college graduate and has been bookkeeper and paymaster for one firm for eight years, to whom he refers. He is competent to take any position of trust in a mill office.

1446 **Boss Machinist or Engineer.** American, 35 years old, married. 12 years in last place. Refers to former and present employers. Familiar with all repair work in cotton mill.

1335 **Loom Fixer or Second Hand.** Knowles and Crompton looms, fancy worsteds and cassimeres, dress goods. German; Protestant; age 37, married. Has been employed in good mills and is very well recommended.

1436 **Boss Dresser.** At present out of work because mill is running slack. Experience covers a large line of goods on D. & F. and Cleveland machines. Would start at $1.25 a day if work was steady. Age 26. Single. A very reliable young man.

1301 **Book-keeper and Paymaster.** Young man of the very highest character desires to move away from the Atlantic coast, on account of his health. Best references from his present and former employers.

1418 **Cloth Hall.** Overseer, shipping clerk or paymaster. Has had a thorough experience in each of the above positions and is familiar with white and colored cotton goods. Is well recommended. Aged 35. Married, and is also a good all around accountant.

## Patents.

(Continued from page 24.)

**Mercerizing.** 615,045. E. Prevost, Crefeld, Germany.

**Picker-stick Attachment.** 615,220. F. M. Hutchison, assignor to himself, W. W. Hutchison and A. B. Hudspeth, Mayfield, Ky.

**Spindle.** 614,896. W. D. Rosencrantz, Hoboken, N. J., assignor to Draper Company, Portland, Me.

**Spinning and Doubling Machinery.** Ring. 614,831. J. Buckley, Liverpool, assignor of two-thirds to J. H. Buckley, Chew Moor, and E. Ashworth, Manchester England.

**Spinning Machine.** 614,834. M. Campbell, Boston, Mass.

**Spindle and Support.** 616,020. E. H. Ryon, assignor of one-half to A. M. Goodale, Waltham, Mass.

**Speeder Machine.** 615,555. E. W. Houghton, Woonsocket, R. I.

**Seed Delinting Machine, Cotton.** 614,435. T. C. Black, assignor to J. B. Jones and C. B. Myers, Little Rock, Ark.

**Shirred Fabric.** 614,609. P. J. Dempsey, assignor to Kursheedt Manufacturing Company, New York.

**Spinning and Doubling Cotton, Apparatus for.** 614,687. T. Ashworth, Urmston, England.

**Spinning Machinery Traverse-bar Actuating Mechanism.** 614,576. J. H. Rawlins, Chester, Pa.

**Tentering Machine Cloth-Carrier** Chain. 616,390. A. W. C. Arnold, Providence, R. I.

**Threads or Yarns of Silk, etc. Apparatus for Clearing.** 616,137. P. Perret, Lyons, France.

**Upholstery. Apparatus for Making.** 616,097. A. Freschl, Milwaukee, Wis.

**Wool Drying Machine.** 615,913. F. G. Sargent, Graniteville, Mass.

**Weaver, Perpendicular Hand.** 614,798. J. Copeland, Rochester, N. H.

## Mill News.

(Continued from page 107.)

—New York, Utica. The Capron Knitting Mill Company, Capron, N. Y., have purchased a lot of land here, upon which they will erect a four-story brick mill. This company has already a large factory in Capron, and they intend removing all their machinery, etc., from the latter place to Utica, as soon as their new building is completed.

—*Ohio, Elyria. The Fay Stocking Company, which, as we reported November 18, was organized at this place, are having some trouble in securing a site for their factory, and it is considered possible, unless they are successful in their efforts, that they may locate in some other town.

—Pennsylvania, Adamstown. Pierce C. Mohn will operate a hosiery factory in the Custer Building. It is stated that he has bought machinery.

—*Pennsylvania, Hummelstown. The knitting mill of W. H. Ulrich and associates is almost completed, and it is expected that the plant will be in full operation by the first of the coming year.

—*Pennsylvania, Duncannon. The new hosiery mill to be operated by I. W. Forry & Son, of Shamokin and Myerstown, will probably be started January 1. About 20 machines are now in place, and when fully equipped, will employ about 200 hands.

—Pennsylvania, Upper Black Eddy. The Hero Knitting Company has been organized here, and will erect a two-story mill.

—Rhode Island, Woonsocket. Orie D. Banfill has started in the manufacture of elder down and stockinettes on Cass Av. He employs a dozen hands.

—Rhode Island, Woonsocket. J. P. Gendron is operating a small factory on Wilton St., in the manufacture of stockings and underwear.

—*Tennessee, Greenville. The company which, as we reported December 2, was projected by H. L. Milligan and others for the establishment of a woolen mill, has decided to add a complete knitting outfit for the manufacture of underwear and hosiery.

## Silk.

**New Mills.**

—*Connecticut, Norwich. Contract has been let for the erection of the new velvet mill for the J. B. Martin Company, Ltd. The building will be of brick, one story, 151 by 149 feet, with a boiler house 37 by 70. It will be completed by March 1.

—New Jersey, Plainfield. A company is projected at this place, to be known as the Plainfield Silk Co., with a capital stock of $25,000. It is proposed to purchase and move to this city, the machinery in the idle mill of the P. & I. Bannigan Co., at Lake View. There is every indication of a successful outcome of this effort.

—*Pennsylvania, Alburtis. We are informed that a silk dyeing establishment will be erected upon the land which we mentioned December 9th had been purchased by a party of New York capitalists. The company will be known as the Hartley Silk Manufacturing Company of Alburtis. A building will be erected, 60 feet wide and 300 feet long, employing 150 operatives, at the start.

—North Carolina, Charlotte. The American Card Clothing Company, Worcester, Mass., are establishing a branch of their business in this city. H. A. White of Philadelphia will have charge. They will not manufacture at this point at present but may later.

—*Ohio, Dresden. The hosiery mill of Kapner Brothers & Duga Hosiery Co. has been rebuilt and been in operation since December 1, employing about 150 hands. Product is cotton and woolen hosiery. They have one set of woolen cards and 75 knitting machines, with a dye house. Their product is sold by William Iselin & Co., New York. This company has a capital of $50,000. President, George Kapner; treasurer, J. Duga, and superintendent, J. B. Mercer.

—THE—

# BALING PRESSES

MADE BY

## BOOMER & BOSCHERT PRESS CO.,

No. 338 West Water St., Syracuse, N. Y.

ARE THE STANDARD.

Hydraulic. Power Screw. Knuckle-Joint.

Chas. B. Cook, *Pres.* Arthur H. Mason, *Treas*
Capital Stock, $500,000.

## SANFORD SPINNING CO.

**Fall River, Mass.**

32,000 Spindles. Weekly product, 65,000 pounds 6s to 30s.

# Colored Cotton Yarn

From American Peelers and Egyptian Cottons.

Solids, Mixtures, Bleached, Combed and Carded Egyptians. Cops and Cones.

## The Best is the Cheapest.

It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

# UNIVERSAL WINDING CO.

F. H. BISHOP, Manager.

226 Devonshire St., - Boston, Mass.

# YARN DEPARTMENT.

## Eastern Yarn Market.

*Cotton Yarn:* Spinners are getting some orders for heavy weight yarns, but the majority have not yet placed orders, and have not been able to get in at the low range of prices. The advance caught many without orders placed, and now the knitters will wait for the reaction. Orders are not generally placed until after the first of the year, as the knitters are running on light weights now, and will continue to do so until April. The fleece-lined underwear continues to sell extensively, and on the cheaper garments is replacing wool. The Philadelphia knitters of light weight underwear have secured many orders, and are running Southern ring-spun yarn almost exclusively. The Yarn Trust held a meeting on the 15th of last month at the "Parker House," Boston, to decide how much it would be expedient to advance the price of cotton yarn. In their circular to the other spinners they point out the fact that cotton has advanced on domestic as well as on Egyptian, and that the mills making fine combed yarn have more orders than they can well handle. In consequence of this, it was agreed to advance prices.

Many of the large Alexandria cotton concerns, handling Egyptian cotton, sold, during the summer and autumn, weekly and monthly deliveries to the trade. These concerns have been caught without cotton to fill their contracts owing to the reduced crop estimates, and a large speculative business, and their endeavor to cover themselves, is forcing Egyptian cotton higher. The hope of seeing lower prices for Egyptian cotton is about abandoned, and it is believed the high prices will be permanent. With this the condition of the cotton market, and with the trust, the master of the situation on combed yarns, and especially as Egyptian cotton has advanced, we look for much higher prices on Egyptian yarn. The spinners of fine yarn have more orders than they can well look after. We wish to state right here that there has not been such a radical advance on cotton cloth in many years, and this will undoubtedly influence spinners to advance prices on yarn. After the first of the year, when the trust on fine cottons get working, knitters may expect to see an advance which will be very radical indeed.

Balbriggan knitters are running full, and are, in consequence, using much 1/40s combed Egyptian. The tariff is helping this class of trade more than any other—Jaeger and silver gray yarn in 1/10s and 1/12s for the ribbed, and 1/20s and 1/26s for the face of fleece lined. The knitters generally are using 1/20s for flat work, instead of 1/10s and 1/11s. This is because it gives an evener surface, and enables knitters to run in Southern yarn. It will do well for the trust to consider carefully the advisability of advancing cotton yarn. Knitters are using more cotton yarn from Southern mills than ever, and these advances are ruinous to knitters who have a hard market to compete in. The outlook is exceptionally good, and the salesmen report more business than has been the case since 1892.

We quote cotton yarns as follows:

| | |
|---|---|
| 1/10s white cop ..... | 11 to 12c. |
| 1/20s white cop ..... | 16 to 17c. |
| 1/10s Jaeger and silver gray ..... | 13½ to 14c. |
| 1/40s combed Egyptian .. | 31 to 32c. |

*Worsted Yarn:* Spinners are keeping after the trade sharp, and anticipate some good orders after the first of the year. The majority of orders will be for yarn from 2/20s to 2/36s for cheviots. Weavers say, if spinners advance prices after the first of the year, the heavy weight season will be ruined, as no large orders will be placed if prices are radically changed.

(Continued on page 131.)

Frank E. Patterson, Prest. Oscar W. Wood, Treas

## Germantown Spinning Co.

**COTTON CARDED**

## HOSIERY YARNS

In numbers from 6s to 26s.

**Germantown, Philadelphia.**

# W. Warren Thread Works,

**WESTFIELD, MASS.**

## HOSIERY AND SEAMING YARNS.

**Also Polished Threads.**

**Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.**

AMERICAN SPINNERS'

## Cotton Yarn Exchange.

COMBED AND CARDED COTTON YARNS

From Northern and Southern Mills.

ARNOLD B. SANFORD, - MFRS. AGENT,

45 Milk Street,

BOSTON, - - MASS.

**Eddy & Street,**

COTTON, WOOLEN, **YARNS AND BRAIDS** WORSTED, SPUN SILK.

**PROVIDENCE, R. I.**

**Cohannet Mills,**

**TAUNTON, MASS.**

Spinners of High Grade

**HOSIERY YARNS** OF EVERY DESCRIPTION.

Selling Agents JAMES E. MITCHELL & CO., Philadelphia and Boston.

*DANIEL S. PRATT,*

180 Summer Street, - BOSTON,

ROOM 24.

851 Calle Piedad, Buenos Aires.

**SOUTH AMERICAN WOOLS,**

..Personally Selected..

Graded to the Standard of U. S. Markets.

**WAVERLY WORSTED CO.**

SPINNERS OF

**WORSTED YARNS**

FOR WEAVING AND KNITTING.

Main St. & Green Lane, Manayunk, Philadelphia.

(Continued from page 129.)

Weavers are opening samples for heavy weights at a lower price than last year, and even at a reduction buyers are keeping out of the market. Spinners are working cautiously, and although they are anxious to sell yarn to keep their frames running, will not sell large blocks of yarn for future delivery.

For instance, these are the orders of a certain salesman: Sell 5000 pounds at a certain price, 5000 pounds at a price one cent higher than the first price given, and keep advancing price one cent per pound on every 5000 pounds offered. By this it will be seen that spinners anticipate higher prices after the first of the year, notwithstanding the desires of weavers.

We hear that one large Providence weaver and spinner is using 40,000 pounds of cotton yarn per week, letting his spinning machinery stand idle. Some spinners who are rigged up for fine work are stopped, because the prices they must sell yarn for, with Australian wool at present prices, are beyond the reach of buyers. These spinners are complaining bitterly against the high wool duties of the Dingley law. Most of the Australian wool is being held for importation prices. The prices that serges are selling at is a wonder to the trade, considering that ¼, ⅜ and ½ blooded wool is off in price. One large spinner, who also has weaving, is sending salesmen throughout the trade advising them not to purchase until they see their line, as they claim that the mill in question is to make the biggest cut in prices ever made.

One weaver we know of started his goods at $1.20 per yard for 18-ounce goods, and had customers who were going to buy at that price, when lo and behold, another manufacturer stepped in, stating that he had 1000 pieces of 18-ounce serges that he would make up and sell for $1.00 per yard. The cloth was as good in every way as that for which $1.20 per yard was wanted. Last year this cloth brought $1.37 per

(Continued on page 133.)

**CATLIN & CO.,**
**YARNS.**
67 Chauncy St., Boston
316 Church St., New York.
206 Chestnut St., Philadelphia.

**ALEX'R KING & CO.**
**YARNS.**
*FINE IMPORTED YARNS A SPECIALTY.*
54 Leonard St., New York.

**JAMES E. MITCHELL & CO.,**
*Commission Merchants.*
122 & 124 Chestnut St., Philadelpia, Pa.
6 & 8 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY **YARNS,**
All Plies and Numbers.
Imported Yarns a Specialty.
82 and 84 BEDFORD ST., FALL RIVER, MASS.

**TUCKER & COOK MFG. CO**
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
**YARNS** 40s and above. AND
FITCHBURG, MASS. **WARPS**

**E. JENCKES MFG. CO.**
Colored Cotton, Hosiery, Woolen and Merino **YARNS**
PAWTUCKET, R. I.

**LINEN YARN IMPORTER.**
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

CAPACITY, 50,000 Spindles.

# ORSWELL MILLS

FITCHBURG MASS.

COMBED OR CARDED

## COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

## The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

*MERCERIZED EGYPTIAN COTTON SPINNING BANDS.*

We claim for them

- They will not shrink nor stretch.
- Are not affected by dry or humid atmosphere.
- Are Fifty per cent. stronger than ordinary bands.
- Will last twice as long.
- Less power required to run spinning.

Mercerized Cotton Yarns which give the High Silk-Like Luster.

PLAIN AND FANCY PATTERN

# Cotton Warps,

**WHITE, MIXED AND COLORED.**

For SATINETS, BLANKETS, ETC.

## WHITTIER COTTON MILLS,

LOWELL, MASS.

## INDIAN ORCHARD COMPANY,

Indian Orchard, Mass.

Manufacturers of - - - -

**COTTON WARPS AND YARNS**

In gray and all colors, single or in any twist.

**COLORED COTTON**

Machined, Carded or in Roving.

**NOVELTY YARNS**

In Cotton, Mercerized Cotton, Silk and Worsted, in various Patterns, Colors and Twists.

We are always pleased to assist our patrons of the Woolen Goods manufacture in special pattern warps for samples.

We use a uniform grade of long stapled cotton in all our manufacture.

(Continued from page 131.)

yard. The above shows the trend of the market. We find that spinners and weavers alike complain of the present uncertain condition of affairs. Some weavers and spinners are offering yarn at prices which vary all the way from 10 to 15 cents under what others can do. This is caused by manufacturers owning stock at ante-tariff prices, and because of this manufacturers do not know where they stand. Besides, it is said that the coarser wools are ranging within 5 or 10 cents of the free wool basis. One weaver told the writer that he had run his mill full during the light-weight season, but at no one time did he have orders enough to last him six weeks at a time, and he had made samples enough to run a dozen mills.

The French spinners are getting orders for sample lots, and many orders placed early in the season for next year have been used to fill requirements this year. The hosiery mills manufacturing worsted stockings, requiring 1/18s to 1/32s, will be forced to replace with further orders later in the season. Manufacturers of this class of work state that their stocks are lower this year than has been the case for many years, and that they expect to run their mills on heavy-weight until the next heavy-weight season starts up. The Astrachan trade has not started yet, but after the first of the year manufacturers are looking forward to a revival of this industry. Prices of French spun yarn are held firmer than English spun yarn, with a better demand, and only the finer grades are used.

We quote prices on worsted yarns as follows:

| | | | |
|---|---|---|---|
| 2/50s Australian ..... | $1.02 | to | $1.05 |
| 2/40s half delaine, half Australian ..... | .90 | to | .92½ |
| 2/40s half blood ..... | .80 | to | .82½ |
| 2/30s half blood ..... | .70 | to | .76 |
| 2/36s ⅜ blood ..... | .70 | to | .72 |
| 2/30s ⅜ blood ..... | .58 | to | .65 |
| 2/14s ¼ blood ..... | .50 | to | .52 |

(Continued on page 135.)

**Colchester Mills,**
SPINNERS OF
Made from Colchester Mills Sanitary Random Yarn
**Mule Spun Cotton Hosiery Yarns.**
Sales in Charge of A. D. SALKELD, 86 & 88 Franklin St., NEW YORK.
Representing B. B. Smalley, Thos. F. Patterson, F. E. Snow Receivers Colchester Mills.

**WOOLEN AND MERINO YARNS.**
Special line for Bicycle and Golf Goods in all shades For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
**The J. & H. Clasgens Co.**
New Richmond, O.

**WOOLEN YARNS.**
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER, - MASS.

A. HERBST. J. W. JONES.
**HERBST & JONES,**
Successors to Kershaw Worsted Co.
**WORSTED YARN SPINNERS,**
21st & Naudain Streets,
PHILADELPHIA.

**ALBERT R. ELSASSER,**
Clifton Worsted Mills.
**Lustre Worsted Roving and Yarns**
A SPECIALTY.
MILLS: ADDINGHAM, DEL. CO. PA.

**C. MOORE & CO.,**
MANUFACTURERS OF
**TWINES, THREADS AND YARNS.**
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

**EICHMANN & STERNBERG**
530 Broadway cor. Spring St., NEW YORK.
**Plain and Gassed Cotton Yarns,**
HOSIERY COTTON YARNS,
Mercerized Cotton Yarns. Harness Twines.

**COTTON WARPS**
White or Colored.
Toweling and Grain Bags.
Dana Warp Mill,
WESTBROOK, MAINE.

HADLEY
SPOOL COTTON AND FINE YARNS COMPANY
COTTON SPINNERS.
MILLS AT HOLYOKE, MASS.

SPINNERS OF
FINE COTTON YARNS
30s TO 100s.
Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.
Fine Cotton Warps, single and two-ply, in chain, etc.
Spool Cotton and Seaming Thread.
95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,
WESTERLY, R. I.
Mills equipped with the latest and most improved machinery.
Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.
Also 2, 3, 4, 5 ply and 6, 9 and 12 ply cable laid.
Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.

FLYER SPUN
Mohair and Worsted
YARNS.
Mohair Plushes,
Worsted and Cotton Braids.
D. COFF & SONS, Pawtucket, R. I.
— ESTABLISHED 1861. —

MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
HOUSATONIC, MASS. 4s to 60s.

YARNS
SOLIS : : BOSTON.
179 Devonshire Street.
ANDREW J. SOLIS, Jr. & CO.

GREENE & DANIELS MFG. CO.,
COMBED, CARDED AND GASSED
Yarns, Threads, Twines and Chain Warps,
Colored and Bleached Yarns Furnished in any manner desired by the trade.
PAWTUCKET, R.I.

A copy of the Textile World's Directory is presented to every paid-up subscriber of the Textile World, with the compliments of the publishers.

(Continued from page 133.)

*Woolen Yarn:* Spinners of woolen yarn are getting some orders for immediate delivery and some orders for delivery after first of the year. Many sample orders are also being placed which will lead to business later. The outlook is very favorable for the woolen yarn spinner. There are a number of mills out of business, and those left will easily secure enough work to run more than full. Prices are lower on all yarns excepting those requiring Australian wool. The worsted weavers will be on the market after the first of the year for backing yarn, and with this demand, together with that from knitters, and also 2-ply yarn for sweaters, caps, and other like articles, there will be much encouragement. There is more wool selling, and more interest is being taken in this article. Prices on domestic wool, from ¼ to ½ blood, are off, and in some instances this wool is selling almost at former free wool prices. This, however, is not the case with fine wool. At present we are going through a period of adjustment of values.

Under free wool the value difference between delaine and Australian, and ¼ to ½ blood, is less than under a protective tariff, because under a protection the great burden of tax is on fine wool. On the coarser grades we can more than hold our own with foreign markets. But on the finer wools we produce so small an amount, as compared with our nominal requirements, that the tariff keeps this class of wool higher in proportion than the lower grades. This is especially noticeable in comparing manufactured fabrics made in Europe with our own. The cloth made from ¼ to ½ blood is much nearer the value of the Australian quality, in Europe, than is the case here, and this is working great injury to our fine mills in this country, and proves that a radical and equable adjustment of the tariff must take place before we can hope to establish the woolen industry on a firm and satisfactory basis.

**Walcott & Campbell Spinning Co,**
IROQUOIS MILLS.
**FANCY HOSIERY YARNS**
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

**BURNET & CO.,**
24 George Sq., Glasgow, Scotland.
All numbers and qualities of Cotton Yarns, specialties in
"Silkoline," "Ramie" and Fancies; also bleached filling on long tubes. Turkey reds, etc. A B C Code used. Telegraphic address "Tenrub, Glasgow."

**B. F. BOYER & CO.,**
Successors to GEORGE SHIMER & BOYER,
**HOSIERY YARNS,**
In Wool, Merino and Worsted.
**GOLF YARNS,**
In Wool and Worsted. Also carry a full line
**BUNDLE YARNS**
For the Jobbing Trade.
MILLS AND OFFICE AT
CAMDEN, - - N. J.

**RICHARD CAMPION,**
Selling Agent for—
Bristol Worsted Mills,
Highland Worsted Mills.
17 Bank Street, Philadelphia, Pa.

## Philadelphia Yarn Market.

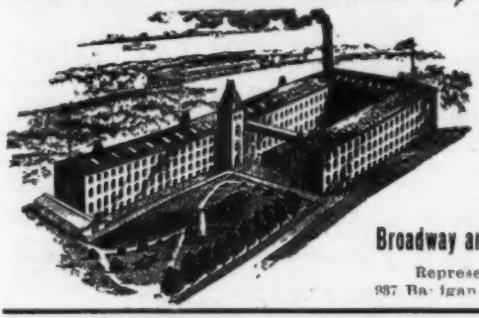
Prices on cotton yarns have been extremely low and weak, until the recent advance in cotton, which has stimulated buyers considerably and influenced the ideas of spinners somewhat. Southern spinners are paying fully ¾ cents advance for cotton. Desirable grades are very scarce. Cotton is generally poor. Many large orders have been placed lately, especially with the underwear trade, and most spinners are fairly well sold up. Some advance has been obtained recently. We quote:

Warps:

| | |
|---|---|
| 20/1 | 12½ |
| 22/1 | 12½ to 13 |

(Continued on page 137.)

## HOWLAND CROFT, SONS & CO.



LINDEN WORSTED MILLS.

**Fine Worsted Yarns**

OFFICE AND MILLS:

Broadway and Jefferson Ave., Camden, N. J.

Represented by FIRTH BROADHEAD,
937 Banigan Building, Providence, R. I.

## ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

FINE FRENCH SPUN

**Worsted YARNS,**

ALL NUMBERS SINGLE AND TWO-PLY,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes

Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

## CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

**NOVELTY YARNS**—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns only.

**CENAPPED YARNS** of all kinds. Doup Yarns. Harness Yarns for Braids, etc.

BRISTOL, R. I.

## *George Campbell & Co.*

## *Worsted Spinners.*

**Yarns, both French System and Bradford.**

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

## MALCOLM MILLS CO.,

MANUFACTURERS OF

**Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.**

Mills, Frankford, Pa. Office, 239 CHESTNUT ST., PHILA.

(Continued from page 135.)

| | |
|---|---|
| 26/1 | 13 |
| 12/2 | 12 to 12½ |
| 14/2 | 12½ |
| 16/2 | 12½ to 12¾ |
| 20/2 | 12¾ to 13 |
| 30/2 | 15 |
| 40/2 | 19½ to 20½ |

Skein:

| | |
|---|---|
| 20s soft | 12 to 12½ |
| 19s | 12 to 12½ |
| 26s | 12½ |
| 4s to 10s soft | 10 to 10½ |
| 12/2 | 11 |
| 14/2 | 11 to 11½ |
| 20/2 | 12½ to 13 |
| 30/2 | 14 to 14½ |
| 40/2 | 19 to 20 |
| 8/3 hard | 10 to 10½ |
| 16/3 slack | 11½ |
| 16/4 slack | 11½ |
| 16/2 slack | 11½ |

Southern cones (various qualities).

| | |
|---|---|
| 6s to 8s | 11 to 12 |
| 10s | 11½ to 12½ |
| 12s | 12 to 12¾ |
| 14s | 13½ to 14 |
| 16s | 13½ to 14 |
| 20s | 14 to 14½ |
| 22s | 14½ to 15 |
| 24s | 14½ to 15½ |
| 26s | 15 to 15½ |
| 30s | 15½ to 16 |

Shuttle Cops:

| | |
|---|---|
| 6s to 8s | 11½ |
| 12s | 11½ to 12 |
| 16s | 12 to 12½ |
| 26s | 12½ to 13 |
| 40s | 15 to 16½ |

Mixed Colored cones:

| | |
|---|---|
| 6s to 8s | 13 to 13½ |
| 10s | 13¼ to 13½ |
| 12s | 14 |
| 14s | 14½ |
| 16s | 14½ to 15 |

Eastern Cops:

| | |
|---|---|
| 10s hosiery | 12 to 12½ |
| 14s " | 12½ to 13 |
| 16s " | 13 to 13½ |
| 20s " | 14 to 14½ |
| 10s shuttle | 12 to 13 |
| 14s " | 12½ to 13 |

Eastern skein ½ cent above cops.

Eastern cones ½ to 1½ above cops.

Egyptian, carded, 4 to 5 cents above white.

Combed yarn 4 to 5 cents above carded.

Woolen and worsted trade extremely dull. Prices are low (about same as last month), although many mills are asking for sample orders.

We quote wool spun cotton yarn as follows:

| | |
|---|---|
| 20 cut black cops | 12½ to 13 |
| 26s | 15 to 15½ |
| 12s to 16s | 12½ |

Other ordinary colors, same price.

---

—Colonial crewel work, or wool embroidery, was the first colonial embroidery. The crewels, or wool threads, spun and dyed by the busy housewife, were traced upon linen of her own weaving, and made beautiful bed-hangings or curtains. The patterns for this dainty work were derived from Eastern fabrics—those of Persia and China, brought by the merchant ships—and these many-colored rich patterns were easily copied by the colonial dame with her variety of colored wools. Sometimes aprons, short gowns, bureau covers and other small pieces of household linen were quaintly and beautifully ornamented.

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
A. T. SKERRY & CO., 47 LEONARD ST., NEW YORK.

Meyer Silkaline made expressly for Cat Stitching Machines, in all sizes and colors on spools and cones, spun and pure, spool and embroidery silks all sizes and colors. Cotton thread on spools and cones. Send for samples prices.
JOHN C. MEYER & CO.,
87 SUMMER STREET, BOSTON.

# CHENEY BROTHERS,

SILK MANUFACTURERS.

ALL KINDS OF

## Knitting Silks, Ribbons AND Piece Silks,

**USED FOR TRIMMING KNIT GOODS.**

**TRAMS, ORGANZINES and SPUN SILKS, in the Hank, or on Spools or Cones, for Manufacturers' Use. Silk for Special Purposes Made to Order.**

**MILLS:** South Manchester and Hartford, Conn.

**SALESROOMS:** 477, 479 and 481 Broome Street, NEW YORK.
929 Chestnut St., PHILADELPHIA.
79 Chauncy Street, BOSTON.
186 Franklin Street, CHICAGO.

# WILLIAM RYLE & CO.,

DEALERS IN

**Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Foreign and domestic**

## SPUN SILK YARNS AND NOILS

**Importers of European and Asiatic Raw Silk.**

54 Howard St., cor. Mercer St., - NEW YORK.

## C. J. LITTLEWOOD & SONS, Ltd.

## ALBION

## DYE and BLEACH WORKS,

**MANAYUNK, PA.**

**DYERS** of Cotton, Cotton Yarns, Wool and Raw Stock Generally. **BLEACHERS** of Cotton and Cotton Yarn.

CITY OFFICE: 132 Chestnut Street. Telephone Connection,

**PHILADELPHIA.** MAIN OFFICE AT THE WORKS.

## THE NOVELTY DYE WORKS,

**BALDWIN & RUDY, Proprietors.**

DYERS OF

WOOLEN, COTTON and MERINO HOSIERY YARNS,

Carpet Chain, Window Shade Cord, Drug Twine, any shade. Correspondence solicited.

**Office, 234 East Fourth Street,** Second Floor, **CINCINNATI, OHIO.**

# PROVIDENCE DYE WORKS.

Dyers and Finishers,

COTTON YARNS, Suited for HOSIERY and WEAVING Cotton, Woolen and Worsted DRESS GOODS, Woolen and Worsted Mixed CASSIMERES and CLOAKINGS, also Woolen and Worsted Slubbing, COTTON YARN and WARP DYERS and BLEACHERS.

**FIRTH & FOSTER CO.,**

OFFICES: **Philadelphia, 546 Bourse Building.**
**New York Office, Silk Exchange, Broadway and Broome St.**
WORKS: **Taylor, Emerald and Adams St., Kensington, Philadelphia, Pa.**

# Boston Finishing Works

**WILLIAMSTOWN, MASS.**

## BLEACHERS, DYERS AND FINISHERS

**Of Pure Finish Shirtings, Sheetings, Canton Flannels and Filled Good Also Silesias, Satteens, Corset Jeans, Cambrics, Sleeve Linings, Pocketings, Flannelette, and all descriptions of Dyed Goods.**

**NAPPING A SPECIALTY.**

Being equipped with the French and other Foreign and Domestic Napping Machines we are prepared to give any kind of Nap required, including the French FlannelFinish.

## R. GREENWOOD & BAULT,

# GLOBE DYE AND BLEACH WORKS,

FRANKFORD, - PHILADELPHIA.

**Specialists in Cotton Warps and Skein Dyeing.**

## HOME BLEACH AND DYE WORKS,

PETER B. McMANUS, Proprietor.

# Dyers and Bleachers of Cotton Yarns,

**PAWTUCKET, R. I.**

## Pawtucket Dyeing & Bleaching Co.,

BLEACHERS AND DYERS OF

**COTTON YARNS AND STOCKINET.**

OFFICE WITH **BLODGETT & ORSWELL CO., Manufacturers of Glazed Yarns,**
**28 BAYLEY ST. PAWTUCKET, R. I.**

# COCHRANE CHEMICAL CO.,

50 Kilby St., Boston, Mass.,

MANUFACTURERS OF

**ACIDS, AMMONIAS, ALUMS, SODAS**

**And other Chemicals.**

# FAST COLORS

for Wool, Woolen and Cotton Yarn and Piece Goods Dyeing, and for Calico Printing

**ALIZARINE RED, PASTE AND POWDER.**

Alizarine Blues, Oranges, Browns, Yellows, Maroon, Gray and Black.
Cœruleine, Galleine, Mythylene Grays.
Thionine Blues, Thionine Indigo, Solid Green and
PATENT BLUES (superseding Extracts of Indigo on account of fastness and color bloom) for Wool and Silk, Benzidine and Primuline Colors, Zinc Dust, Aniline Salts and Oil.

**VICTOR KOECHL & CO.** 122 HUDSON ST., NEW YORK.

SOLE AGENTS FOR

FARBWERKE, formerly MEISTER, LUCIUS & BRUENING, HOECHST o | M.; A. LEONHARDT & CO., Muehlheim o | M.

BRANCH OFFICES:

Boston, Mass., 138 Milk St.; Philadelphia, Pa., 39 N. Front St.; Providence, 45 S. Main St.

---

# New York and Boston Dyewood Company,

MANUFACTURERS OF

**DYEWOOD EXTRACTS.**

Sole Agents for the United States and Canada for
ACTIEN-GESELLSCHAFT FUR ANILIN-FABRIKATION, BERLIN.
Specialties for Wool, Silk and Cotton.

**BENZO PURPURINE B, 4 B, 6 B; BRILLIANT PURPURINE R; BRILLIANT CONGO R, etc.**
**CHROME FAST BLACK B, a new fast black for wool.**

NEW YORK: 55 BEEKMAN ST. PHILADELPHIA: 124 ARCH ST.
BOSTON: 117 HIGH ST. HAMILTON, ONTARIO.

---

Established 1834. H. G. JOHNSON, Proprietor.

# Wm. G. Johnson Co.

Manufacturers of

**DYEWOODS** Logwood Extracts, - - -
Ground and Bolted Camwoods
And other Fancy Woods. -

All Goods Warranted Uniform.

Long Distance Telephone. **UNCASVILLE, CONN.**

# JOHN J. KELLER & CO.,

104 and 106 MURRAY STREET,
NEW YORK.

220 Church St., Philadelphia. 135 Pearl St., Boston.

## Aniline Colors,
## Dyewood Extracts,
## Sumac and
## Nutgall Extracts.

FAST COLORS for wool dyeing, one dip cotton colors, novelties and specialties for calico printing.

—— MANUFACTURED BY ——

JOHN R. GEIGY & CO., Basle, Switzerland.

## Wm. J. Matheson & Co., Ltd.

IMPORTERS AND
MANUFACTURERS OF

# DYE STUFFS

New York,
Boston,
Philadelphia,
Providence,
Charlotte, N.C.,
Montreal, Canada.

## FARBENFABRIKEN OF ELBERFELD CO.

40 STONE STREET, NEW YORK.

OSTON. PHILADELPHIA. CHICAGO

# Alizarine Black-Bayer

(DIAMOND BLACK.)

## The Cheapest Fast Black for Wool.

# C. BISCHOFF & CO.,

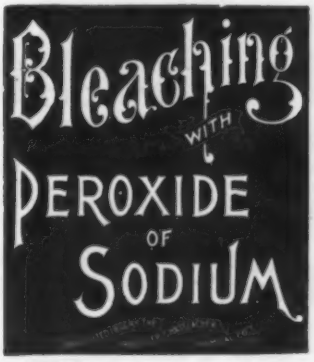
87 and 89 Park Place, New York. Branches, 139 S. Front St., Phila. 124-126 Purchase St., Boston.

Rhodamines, Patented.

Alizarine Blacks, Patented.

## WITHOUT COST

Bleachers can obtain all necessary information regarding




by writing for free copy of pamphlet to

## THE ROESSLER & HASSLACHER CHEMICAL CO.

OFFICE: 100 WILLIAM ST., NEW YORK.

Peroxide Works, Niagara Falls.

Boston, 21 Pearl St.
Chicago, 4 N. Clark St.

# O. S. JANNEY & CO.,

IMPORTERS OF

INDIGO, CUTCH, GAMBIER, SICILY SUMAC, ANILINES, ETC.

AND DEALERS IN

**Dyestuffs, Extracts and Chemicals.**

Full Lines of Direct Colors for Cotton, and Acid Colors for Wool.

No. 70 Kilby Street, BOSTON.

No. 8 and 10 Letitia Street, PHILADELPHIA.

# SYKES & STREET,

NEW YORK.

BOSTON. CHICAGO. PHILADELPHIA.

**Aniline and Alizarine Colors.**

**Aniline Oil and Salt.**

**Dyewood Extracts, Etc.**

# THE STAMFORD MANUFACTURING CO.

MANUFACTURERS OF

CUT and GROUND DYEWOODS,

**Dyewood Extracts and Liquors,**

**FLAVINES.**

Importers of CHEMICALS and DYESTUFFS.

**183-187 Front Street, - New York.**

ESTABLISHED 1865.

**ANCHOR COLOR MANUF'NG CO.,**

Importers and
ANILINES, DYESTUFFS and CHEMICALS.
New Belgium Blue. . . .

Manufacturers
Direct Colors for Cotton, Wool and Mixed Goods.
462-466 Cherry St., NEW YORK.

**OAKES MANUFACTURING CO.,**

**Hematine, Extracts of Dyewoods, Chemicals.**

New York. Boston. Philadelphia. Atlanta.

## A. KLIPSTEIN & CO.,

NEW YORK. BOSTON. PROVIDENCE. PHILADELPHIA.
CHICAGO. CINCINNATI. HAMILTON.

# Dyestuffs and Chemicals.

**Fast Colors for Wool.**
Dry Alizarine.
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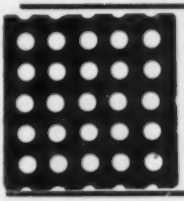

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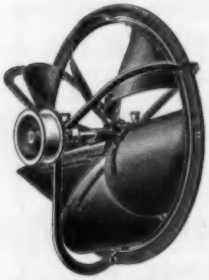

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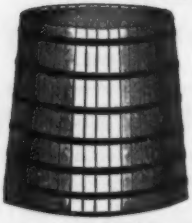

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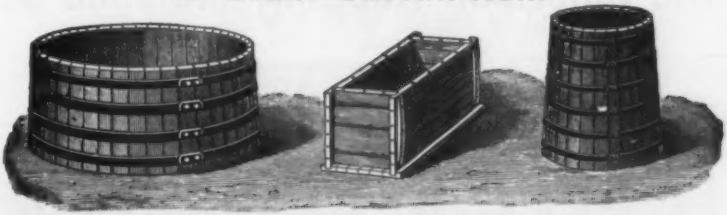

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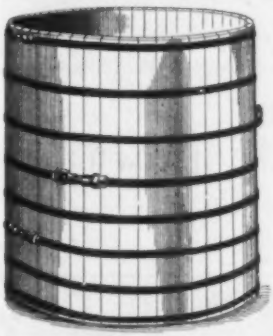

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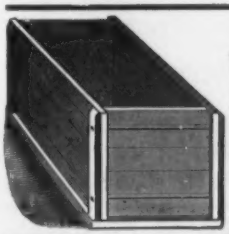

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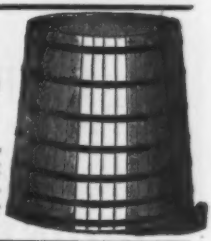

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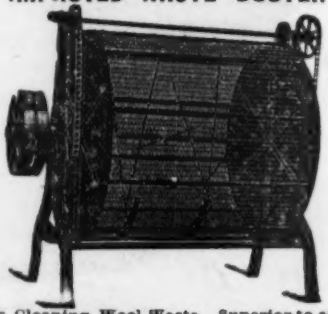

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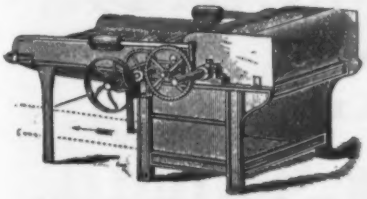

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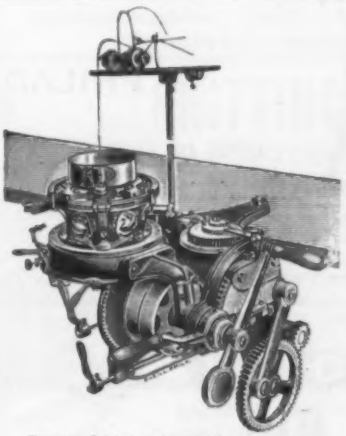

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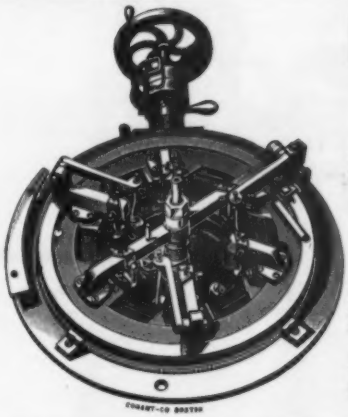

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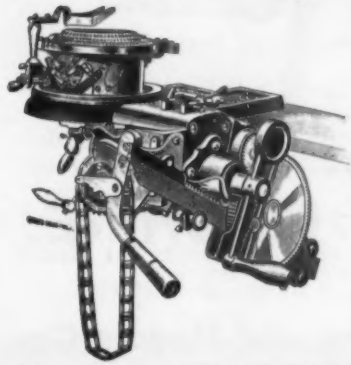

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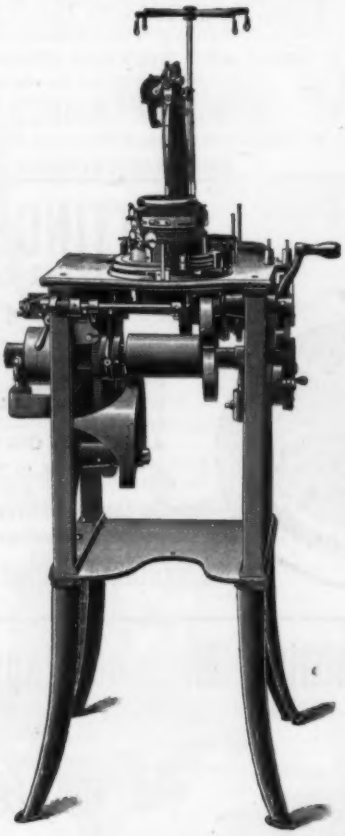

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## Recent Important Improvement.

Entirely new method of transferring by which it is impossible to drop stitches.

Change of guage easily accomplished.

Yarn changer and high splicer.

Simple and effective in operation.

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For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.

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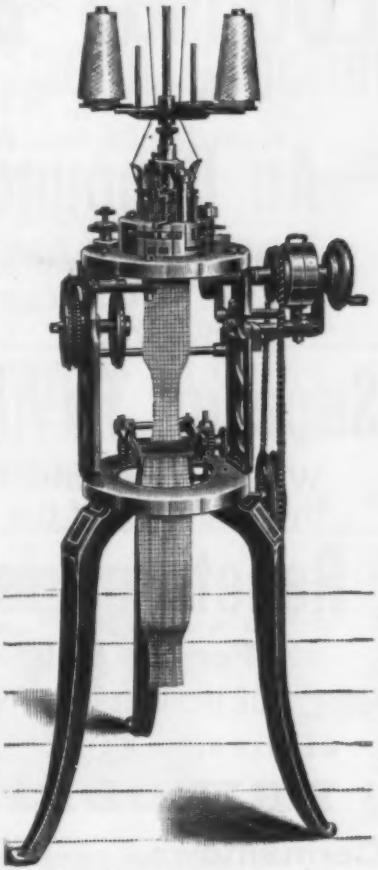

Automatic Sleever ane Fancy Hosiery Machine.
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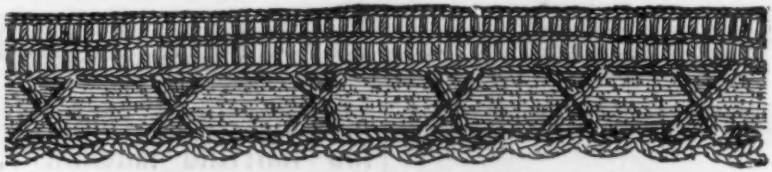

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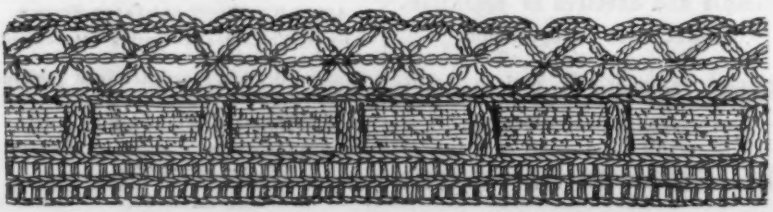

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Trimmers attached to all kinds of Sewing Machines.
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Gives greatest production, fewest menders, less cost for maintenance and best fabrics.

More Standard in use than any Automatic Machine on the market.

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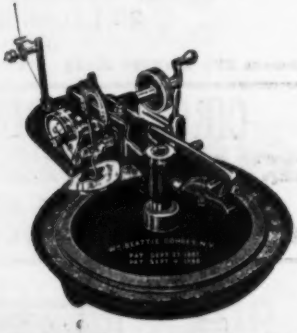

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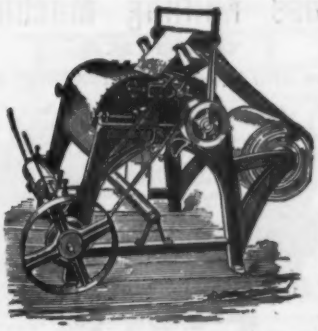

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Carefully constructed, substantially built.

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Delicate Adjustment, High Speed with Durability.

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Grosser's Unrivalled

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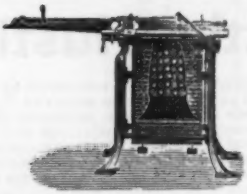

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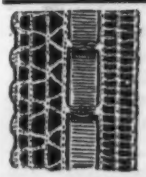

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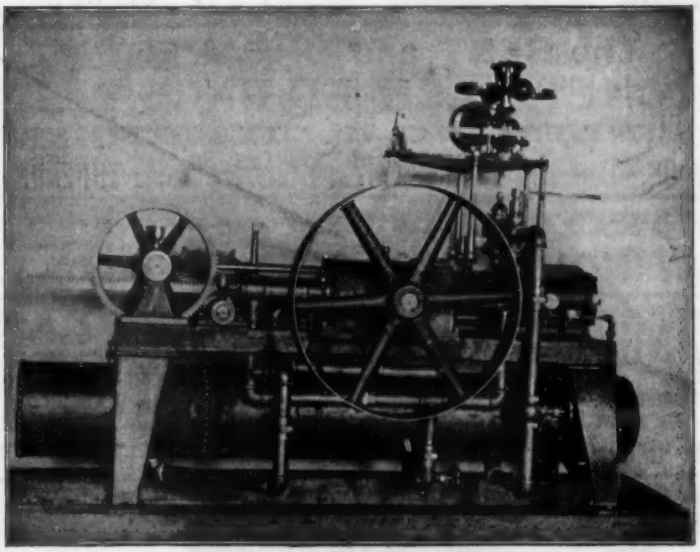
Shown in the accompanying cut is used exclusively by the Columbia Water Power Co., of Columbia, S. C., for governing the electrical transmission plant furnishing power to two large cotton mills. A technical journal recently stated that the noiselessness, cleanliness and speed attained by use of electric power in this mill are marvelous.



The late Areatus Blood, president of the above company, wrote us as follows: "I am pleased to write that your governors applied at the plant of the Columbia Water Power Co. work to perfection, and give entire satisfaction."

The same make of governor is used by the Massachusetss Cotton Mill of Lowell; the Merrimack Mills of Lowell; the Baltic Power Co., driving the Taftville (Conn.) Mills; Coburn Woolen Mills, Skowhegan, Me.; Boston Duck Co., Bondville, Mass.; Eagleville Mills, Eagleville, Conn.; The Lonsdale Co., Lonsdale, Conn.; Fries Mfg. Co., Salem, N. C.; Mishawaka Woolen Mfg. Co., Mishawaka, Ind.; Briggs Mfg. Co., Voluntown, Conn.; and many others.

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*UPRIGHT AND HORIZONTAL.*

**Suitable for all Heads from 3 Feet to 2000 Feet.**

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Designing and building Water Wheels for all purposes and situations. These wheels secure a **High Guaranteed Percentage; Great Steadiness** under variable loads; an **Unequaled Concentration of Power,** and an **Unprecedented High Velocity. Its quickly operating balanced gates** afford **prompt** and **fine regulation** by governor.

**Satisfaction Guaranteed where others fail.** Write for catalogue of either wheel.

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Upright and Horizontal from 3 Horse-power upwards.

***AUTOMATIC AND PLAIN SLIDE VALVE ENGINES.***

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Have you a water power that you wish to develop? or a defective wooden penstock that you must repair or replace? Then secure descriptive circular and price of my steel penstocks. They are cheaper than wood, they are indestructible, they are absolutely water tight; they are constructed on the ground where they are to be used, therefore can be adapted to the most difficult places. They will stand any head of water, they can be made of any size desired; they have been tested and approved for years. For full information and price, address the manufacturer,

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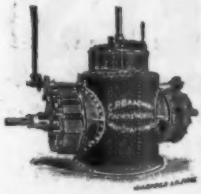
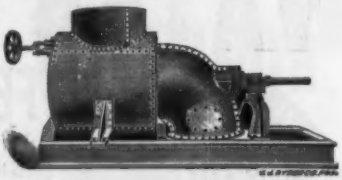
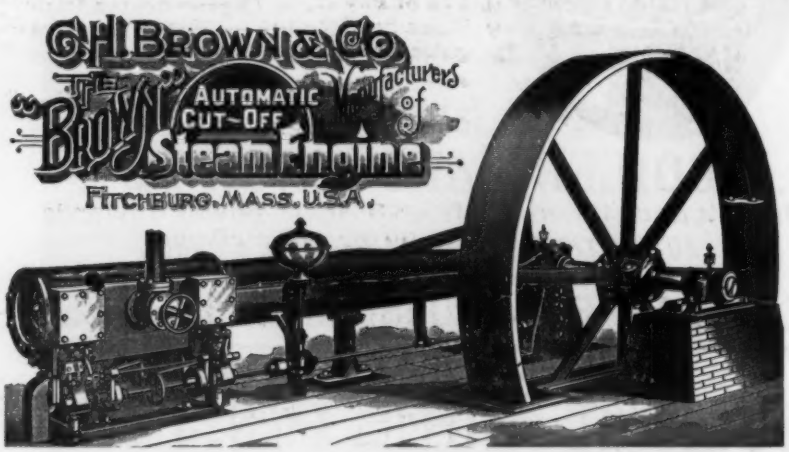


Through its peculiar gate construction, it is guaranteed to give better results with variable quantity of water, than any other wheel. The peculiar advantages of this wheel cannot be shown by a picture, but can easily be demonstrated to any practical man. The full gate principle at all stages of gate opening, and gate shut tight first, last and always. Will sheer off obstructions. On, two or three wheels can be set on one base. I adapt wheels to any conditions, and guarantee satisfaction. My new regulator is the simplest in construction and the most efficient in result of any in the market. It is connected to the gate either by gears or chain belt and sprocket wheels. **Price of Regulator $100.** I also make water motors, governors, steel tubing, grinding mills, and general mill machinery.



**C. P. BRADWAY West Stafford, Conn.**

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Detailed information is given about each establishment, viz., the name of the company or firm, names of officers, agent, superintendent, what the mill makes, number sets of cards and combs (if woolen), number of spindles, number of looms, whether steam or water power, whether a dye house or not, who the selling agents are, or if the mill sells direct. In many instances it gives the name of the buyer of raw materials and supplies. To the travelling man, this directory is invaluable, as the maps give the location of the towns where there are mills, so that trips may be planned. The railroad connections are given, and distances may be estimated accurately from the maps.

IT ALSO HAS LISTS OF LARGE BUYERS OF TEXTILE FABRICS FROM FIRST HANDS INCLUDING MANUFACTURERS' SELLING AGENTS AND DRY GOODS COMMISSION MERCHANTS IN PRINCIPAL CITIES; THE MANUFACTURING CLOTHIERS, SUIT AND CLOAK MAKERS, JOBBERS, LARGE RETAILERS BUYING FROM FIRST HANDS. ALSO LISTS OF DEALERS IN RAW MATERIALS IN PRINCIPAL CITIES, INCLUDIND RAG DEALERS. BUYERS' INDEX OF TEXTILE MACHINERY AND SUPPLIES.

**The Lists of Buyers are of great value to the Mills.**

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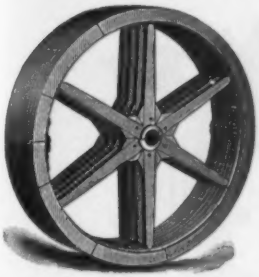

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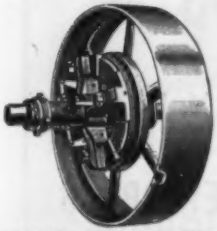

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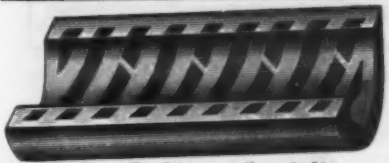

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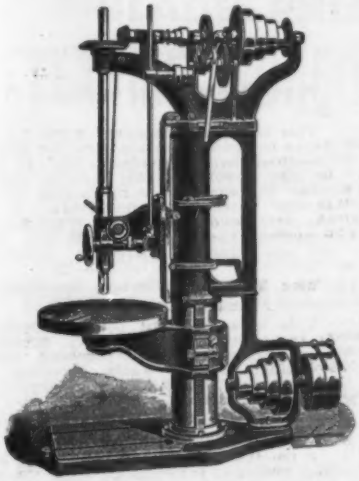

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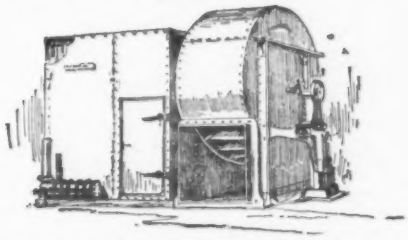

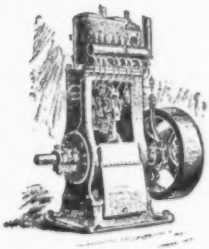

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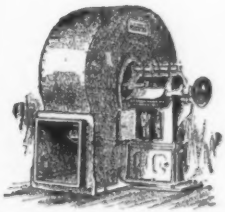

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